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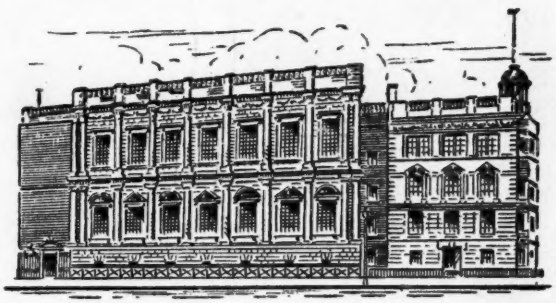
JOURNAL



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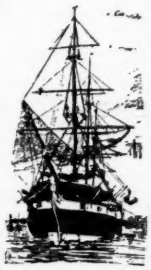

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The Royal United Service Institution is situated just below the War Office in Whitehall. It has the best professional Library in the United Kingdom; a Lecture Theatre where an autumn and winter session of lectures is devoted to subjects of current or historical Service interest. The Reading and Smoking Rooms are provided with the leading papers, periodicals and writing materials.

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The R.U.S.I. JOURNAL is published quarterly and sent post free to Members in any part of the world.

THE MUSEUM.

Situated in the Banqueting Hall of the old Palace of Whitehall (1622), with its magnificent Rubens ceiling, the R.U.S.I. Museum is a treasure house of relics and mementoes of great victories and renowned warriors. There is also a most valuable collection of Uniforms, Medals, Ship Models, and models of the battles of Trafalgar and Waterloo.

For Members and their friends, there are private entrances to the Museum from the Institution.

H.M. Forces in uniform are admitted free at the public entrance.

Admission to the general public is 1s.; Saturday after Noon, 6d.

SECRETARY'S NOTES

May, 1930.

Message to His Majesty the King.

The following message was sent on 6th May to H.M. the King, on the twentieth anniversary of his Accession :—

"Council of the Royal United Service Institution assembled this afternoon beg your Majesty to accept their loyal and dutiful good wishes on this anniversary.

FIELD-MARSHAL SIR CLAUD JACOB, *Chairman*."

The following gracious reply was received from His Majesty :—

"Field-Marshal Sir Claud Jacob: I sincerely thank you and the Council of the Royal United Service Institution for your loyal message of congratulation upon the 20th anniversary of my accession.

GEORGE, R.I."

Message to H.R.H. the Duke of Connaught.

The following message was sent on 1st May to H.R.H. the Duke of Connaught :—

"Chairman, Council and Members of Royal United Service Institution respectfully tender their congratulations to their President on his eightieth birthday."

The following reply was received from His Royal Highness :—

"My grateful thanks to the Council and Members for their kind congratulations.

ARTHUR."

Council.

At the Annual General Meeting the following were unanimously elected to fill the vacancies on the Council :—

ARMY.

Lieutenant-General Sir A. A. Montgomery-Massingberd, K.C.B., K.C.M.G.
Brigadier B. D. Fisher, C.B., C.M.G., D.S.O., A.D.C.

TERRITORIAL ARMY.

Colonel J. Josselyn, C.M.G., D.S.O., O.B.E., T.D.

Chairman of the Council.

Field-Marshal Sir Claud Jacob, G.C.B., K.C.S.I., K.C.M.G., has been elected Chairman of the Council for the year 1930-1931.

Admiral Sir W. E. Goodenough, G.C.B., M.V.O., A.D.C., has been elected Vice-Chairman of the Council for the year 1930-1931.

Council Committees.

The Finance, Journal and Library, and Museum and General Purposes Committees have been re-elected for the year 1930-1931.

Colonel B. Abel Smith, D.S.O., M.C., T.D., A.D.C., has been elected Chairman of the Finance Committee in the place of Colonel C. W. Trotter, C.B., T.D., who has resigned from that Committee. Colonel J. Josselyn, C.M.G., D.S.O., O.B.E., T.D., has been elected to the Finance Committee vice Colonel Trotter.

Wing Commander O. T. Boyd, O.B.E., M.C., A.F.C., has replaced Group Captain E. L. Gossage, D.S.O., M.C., on the Journal and Library Committee.

New Members.

The following Officers joined the Institution during February, March and April :—

ROYAL NAVY.

C. W. Murray, late Sub-Lieutenant, R.N.V.R.
Lieutenant Commander C. P. Clarke, R.N.
Captain M. H. Collet, M.C., R.M.
Rear-Admiral H. S. Monroe, D.S.O.
Lieutenant Commander C. B. Allen, R.N.
Sub-Lieutenant P. H. Higginbotham, R.N.
Lieutenant J. R. S. Brown, R.N.
Sub-Lieutenant J. Grant, R.N.
Captain H. A. P. de Berry, R.M.
Lieutenant E. H. Dyke, R.N.
Paymaster Sub-Lieutenant C. W. Sheldon, R.N.R.
Lieutenant P. C. P. Thomas, R.N.
Captain E. J. G. Mackinnon, D.S.O., R.N.
Lieutenant J. S. S. Litchfield,Speer, R.N.
Lieutenant R. C. M. Duckworth, R.N.

ARMY.

Lieutenant L. G. Whistler, Royal Sussex Regt.
Captain P. H. Highfield-Jones, M.C., South Staffordshire Regt.
2nd Lieutenant J. Sykes-Wright, Queen's Royal Regt.
2nd Lieutenant R. L. N. Gowans, King's Own Yorkshire Light Infantry.
Lieutenant H. de L. Walters, The Buffs.
2nd Lieutenant P. D. Miller, Grenadier Guards.
2nd Lieutenant G. R. C. Barnett, R.A.S.C.
Captain G. Horsfield, R.A.
2nd Lieutenant D. R. Daly, Scots Guards.
J. V. H. Campbell, late Lieutenant The King's Liverpool Regt.
Captain C. G. Robins, York & Lancaster Regt.
Colonel E. J. Carter, late Royal Tank Corps.
2nd Lieutenant A. M. Man, Middlesex Regt.
2nd Lieutenant W. J. Armstrong, Leicestershire Regt.
2nd Lieutenant H. Marsh, Middlesex Regt.
Lieutenant B. E. Horton, Royal Welch Fusiliers.
2nd Lieutenant P. C. Grant, R.E.
2nd Lieutenant P. B. I. O. Burge, Royal Warwickshire Regt.

Gentleman Cadet P. A. G. Glyn.
2nd Lieutenant G. W. I. Shipp, The Cameronians.
2nd Lieutenant G. A. D. Taylor, Scots Guards.
Lieutenant A. F. Toogood, R.E.
2nd Lieutenant K. T. Roper, The Dorsetshire Regt.
Lieutenant G. G. O. Lyons, R.A.
2nd Lieutenant E. B. W. Cardiff, Scots Guards.
Gentleman Cadet L. C. Marson.
2nd Lieutenant G. Shaw, The Cameronians.
Colonel G. R. F. Talbot, late R.A.
Lieutenant H. J. B. Cracroft, Royal Tank Corps.
Lieutenant W. R. Wilson, R.A.
Captain R. S. M. White, The Leicestershire Regt.
Captain H. R. B. Watkins, R.T.C.
Captain W. L. de Courcy-Baldwin, R.E.
Captain A. A. Miller, Scots Guards.
Captain C. A. A. Robertson, Scots Guards.
Lieutenant G. K. Bourne, R.A.

ROYAL AIR FORCE.

Group Captain L. A. Pattinson, D.S.O., M.C., D.F.C., R.A.F.
Wing Commander R. H. Peck, O.B.E., R.A.F.

Gold Medal Essay for 1929.

The Report of the Referees appointed to adjudicate on the Gold Medal Essay for 1929 will be found on page 252 of this JOURNAL. The Gold Medal and First Trench Gascoigne Prize of thirty guineas was presented to Wing Commander C. J. Mackay, M.C., D.F.C., R.A.F., at the Annual General Meeting.

Special Facilities for Junior Officers.

The special attention of Members is invited to the new Bye-Law governing the entrance of Junior Officers to the Institution, which was passed at the last Annual General Meeting. The terms are as follows :—

" Commissioned Officers of the Home, Dominion, Indian and Colonial fighting Services and their Reserves, of three years or less seniority as such ; Midshipmen, R.N., R.N.R. and R.N.V.R. ; and Naval, Military and Air Force Cadets, shall be admitted to Membership without Entrance Fee on payment of the first annual subscription of £1 5s.

" In all cases eligibility for such Membership shall be governed by para. 1 of Chapter 2.

" An Officer who is admitted without entrance fee and who subsequently fails to pay his annual subscription regularly or resigns, shall not be re-admitted without payment of such fee, notwithstanding the fact that he may, by virtue of his rank or seniority, be otherwise eligible for such concession.

" Officers joining under this Bye-Law will date their Membership from 1st January of the year in which they join. They shall not have the privilege of becoming Members in October and of paying no subscription on the ensuing 1st January."

Members Addresses.

Members are reminded that they are responsible for keeping the Secretary informed of any change of address. Non-receipt of the JOURNAL is almost invariably attributable to the fact that the Member has not notified his movements.

JOURNAL

Copies of the Frontispieces.

A limited number of copies of the coloured Frontispieces, published in recent numbers of the JOURNAL, are available for sale and can be supplied, post free, for 1s. 6d. each; 2s. 6d. a pair; 3s. 6d. for three; or 5s. the complete set.

Price of Journal to Non-Members.

The price of the JOURNAL to Non-Members, as from February, 1927, number, is 7s. 6d., or the four quarterly numbers will be sent for an annual subscription of £1 10s.; post free in either case.

Trade Discount.

Recognised firms can now be supplied with not less than one dozen copies of the JOURNAL at a time, at a wholesale price of 7s. each copy, the buyer to collect from the Institution.

Additional Copies of the Journal.

Additional copies of early numbers of the JOURNAL, if available, can be supplied, post free, to Members at :—

3s. for JOURNALS prior to February, 1927.

4s. for the JOURNAL of February, 1927, and later.

LIBRARY

Facilities for Borrowing Books.

The special attention of Members who are now paying the new annual subscription of £1 5s. od., is invited to the fact that they are thereby entitled to the full privileges of the Lending Library without further charge. These include the right to have sent to them not more than four volumes at a time on loan, the Member paying postage both ways.

Old Members who have not wished to conform to the new arrangement and who are still paying the original subscription of £1 1s. od., must pay an additional subscription of 10/- per annum in order to belong to the Lending Library.

All Members are of course, free to use the Library when they visit the Institution.

Rules Governing Return of Books.

The attention of Members is invited to the following Regulations governing the retention and return of books :—

(1) Certain books, for which there is a special demand, must not be retained longer than a fortnight after the date of receipt. A notice to this effect will be found in the book.

(2) In the United Kingdom.—Books must normally be returned within one month of the date of issue ; but the Librarian is authorised to make extensions of one month at a time on application by a Member, up to a maximum of three months from the date of issue, if the work is not required by another Member.

(3) All Stations Abroad.—Books must not be retained for more than seven months from the date of issue.

Members are specially requested to conform strictly to these regulations, as failure to do so causes much inconvenience to others and involves the Institution in unnecessary expense and clerical labour.

MUSEUM

Special Exhibition.

A series of dioramas depicting famous military engagements, kindly lent by the Department of Overseas Trade, are now on view. These, together with the model of a section of the Western Front, and new models of tanks and other Army exhibits, typify British military activities over a period of nearly nine hundred years.

Portrait of Nelson.

The Museum Committee are anxious to acquire a good portrait in oils of Admiral Lord Nelson.

Regimental Badges & Buttons.

It is desired to complete the Institution's Collection of Regimental Badges and Buttons, including those of the Regular units, Militia and Volunteers.

Will Members who can make contributions to the collection communicate particulars to the Curator, who will inform them whether the Badges or Buttons offered are already in the collection.

Additions.

(8320) Medals of Major-General Sir F. Smith.
(8321) Narrative of the wreck of the " Mary Rose," bound in the wood of the wreck.
(8322) Narrative of the wreck of the " Royal George," bound in the wood of the wreck.
(8323) Seal of the Duke of Cumberland, picked up on the field of Fontenoy.
(8324) Set of Medals.
(8325) Model of a Mark II Tank.

(8326) Set of Silhouettes of Warships.
(8327) Statuette of a Light Dragoon, 1790.
(8328) Tunic and Mess-jacket, 3rd Bombay Light Cavalry.
(8329) Tunic of Rossall School Volunteers, 1850.
(8330) (*a*) Trafalgar Cup presented by the Patriotic Fund of Lloyds to Captain W. Hargood, who commanded H.M.S. " Belleisle " at that victory.
(*b*) Pair of wine-carriers made from the timber of H.M.S. " Belleisle," presented to Captain W. Hargood by his friend, Admiral Ross.
(*c*) Manicure-set found in the well at Cawnpore, 1857, after the massacre.
(8331) Pair of candlesticks carved by French prisoners of war from marrow bones.

Loan.

(3882) Watch worn by Lord Nelson at the Battle of Trafalgar.

Attendance.

The amount taken for admission during the past Quarter was :—

£90 18s. 0d. in February.

£86 5s. 0d. in March.

£252 3s. 6d. in April.

Purchase Fund.

This Fund has been opened to assist the purchase of new exhibits. The Council hope that it will receive the support of Members interested in the Museum,

	£	s.	d.
Balance in hand	32	7	3
B. E. Sargeaunt, Esq.	2	0	0
Sale of Relics presented by Lieut.-Colonel H. G. de Watteville	15	0	0
" Anonymous "		10	0
Captain H. Bullock		5	0
	£50	2	3

Purchased :—	£	s.	d.			
Models of Submarines	15	0	0			
Carden Loyd Model	20	0	0			
Silhouette Models of Warships	5	0	0			
Statuette of Light Dragoon	3	10	0			
				43	10	0
				£6	12	3

From the Original by T. Ivester Lloyd.

Diorama lent by courtesy of the Dept. of Overseas Trade.

QUEEN ELIZABETH REVIEWING TROOPS AT TILBURY, BEFORE THE ARMADA

ONE OF THE DIORAMAS NOW SHOWING IN THE R.U.S. MUSEUM

THE JOURNAL
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[Authors alone are responsible for the contents of their respective Papers. All communications (except those for perusal by the Editor only) should be addressed to the Secretary, Royal United Service Institution.]

GOLD MEDAL ESSAY (AIR) FOR 1929

SUBJECT:

"The Role of Aircraft in Coast Defence."

BY WING-COMMANDER C. J. MACKAY, M.C., D.F.C., R.A.F.

Motto;

"The race is not to him that has the longest legs to run;
nor the battle to the people that shoot the biggest gun."

I. INTRODUCTION.

IT is natural that the first big war of the mechanical age should have raised many problems which its abrupt termination has left unsolved. All wars teach many lessons, but the last enjoys the distinction of having left as many problems to be solved as there are lessons to be learned. It has confirmed the eternity of the principles of war, the dominant role of the foot soldier, and of the battleship as the unit of sea power. It has demonstrated the capabilities of the machine gun and the power of artillery scientifically applied; but equally it has left such queries as whether the tank is the answer to the machine gun; whether the aeroplane can subdue the civil will; and so forth.

The Great War asks innumerable questions and raises many controversies. Many of these concern aircraft, and it is one of them that it is our task to examine; moreover, it happens to be one on which the last war throws little light. Coast Defence is, moreover, a subject

NOTE.—Official requirements and considerations of space have necessitated a number of excisions from the author's original Essay—EDITOR.

which has always provided a wide and fertile field for controversy. In the past its protagonists urged its importance at the expense of the sea-going fleet, and with some success, as the coasts of Britain still bear mute witness.

To-day the problem is not to what extent should coast defence works be established, but rather, with what weapon should coast defence be equipped. If, however, the ensuing investigation reveals the aeroplane as an adequate weapon for the defence of certain bases, it does not necessarily follow that it is the proper weapon for the defence of each and every naval base in the British Empire, whatever its geographical position, and whatever the scale of attack to which it may be exposed. It is, therefore, proposed, at any rate in the first instance, to narrow this investigation into an enquiry as to whether the aeroplane is an efficient substitute for the 15-in. gun. But before doing so, it is necessary briefly to consider coast defence in its relation to Imperial defence, the importance of bases generally and the methods by which the scale of their defence is assessed. It is not proposed in any part of this paper to study the question of an invasion of our coasts. Invasion, as distinct from raids, pre-supposes a British defeat at sea. Defeat at sea would be the prelude, not to a discussion on resisting invasion, but to negotiations for the best terms of peace which could be obtained.

II. The Relation of Coast Defence to Imperial Defence.

Unless the coast defences of a maritime country fit into the general scheme of preparation for war, they become a source of weakness by diverting expenditure from essential requirements. However obvious this may appear to be, it is a fact frequently overlooked, and it is one requiring special emphasis at the present time, since there has always been a tendency for coast defence expenditure to vary inversely to naval strength. That the United States spend generously on both proves nothing except their wealth. Coast fortification on a vast scale is a luxury in which that country has always indulged since the French engineer, General Bernard, arrived in America in 1816. Since the days when the American Board on Fortifications proposed to spend twenty-two million dollars on fortifying the relatively unassailable port of San Francisco, American public opinion has always been satisfied with the sight of immense fortifications—technically bad in their day and now worthless—while the American sea-going fleet was often deprived, in consequence, of its essential requirements. But, while American professional opinion continues to be that " coast artillery holds the front line, the sea coast,"[1] the correct relation of coast defence expenditure

[1] " Coast Artillery Journal," March, 1920; June, 1921.

to national defence expenditure in that country is not likely to be appreciated.

It is upon the fleet and not upon coast fortification that the security of the British Empire rests. The importance of coast fortification lies only in providing secure bases for the fleet, from which it can operate with freedom.

III. Bases.

The security of bases for the fleet is essential in order that, as President Taft once put it, the Navy shall be "foot-loose."[1] A fleet is essentially an offensive weapon, one of whose main assets is mobility; if tied to the protection of a base its mobility must be sacrificed. It was the lack of defences at Trincomali that handicapped Sir Edward Hughes' fleet, and thus eventually led to the capture of the port by Admiral Suffren in 1782.

It is clear, therefore, that those posts or bases which the Admiralty may define as essential to the operations of the fleet must be adequately defended. But hitherto, when the scale of defence has been fixed its provision has been largely a matter for the War Office, and this part of the Army's contribution to sea power has provided some of the finest pages in the history of the British Army.

The probable forms of attack on bases in the future can be summarized as follows:—

(i) A landing in force to capture a base.
(ii) A raid by land forces to destroy its naval facilities.
(iii) Bombardment by a battle-fleet.
(iv) Bombardment by cruisers or smaller craft.
(v) Land-based air attack, if within range.
(vi) Carrier-borne air attack.

The Navy assists directly in meeting the above by the provision of mines, nets and booms. In parenthesis it should be noted that in May, 1918, the Italians crossed the boom at Pola by means of a motor boat fitted with tracks. The submarine is not suitable for coast defence purposes: a fact not fully recognized before the war;[2] its limitations detract from its deterrent power in coast defence and, in any event, the submarine is part of the mobile forces of a fleet and so cannot be tied down to the defence of particular places.

Apart, therefore, from infantry whose presence will always be essential to the protection of a base of first-class importance, there comes next for consideration: the gun.

[1] President Taft; Address to U.S. Naval War College, 1909.
[2] Particularly by the French "Jeune Ecole."

IV. The Gun—Yesterday.

Since Nelson, before Calvi in 1794, wrote to Lord Hood that "the business of laying wood before walls was much altered of late," the coast defence gun has been recognized as superior in fire power to the bombarding ship. There have been two minor exceptions which will be mentioned, but it is unnecessary to go back (beyond 1806) to prove the accuracy of Lord Nelson's foresight.

At Cape Licosa in that year a single gun successfully opposed an 80-gun British ship and two frigates, which expended most of their ammunition without effect. In 1793 a redoubt in Corsica, mounting two 18-pounders and one 9-pounder, repulsed the three line-of-battle ships, "Alcide," "Courageux" and "Ardent," with loss.

In 1794 a tower in Martello Bay, Corsica, drove off two ships, the "Fortitude" and "Juno." It was, incidentally, this action which led to the erection of Martello towers all over Great Britain: an excellent example of losing sight of the relation of coast defence to naval strength.

The "Wasp" and "Telegraph" batteries at Sevastapol put six British ships out of action.

In May, 1898, Admiral Sampson's fleet of seventy-two guns, varying from 13-in. down to 4-in., bombarded San Juan without injury to the forts. At Santiago the American fleet bombarded the shore batteries on ten occasions, killing in all ten Spaniards and demolishing one gun, while two of their ships, "Indiana" and "Texas," were hit.

In 1894 the Japanese never exposed their ships to the fire of the Chinese shore batteries, but at Wei-hai-wei the Japanese most effectively used the captured coast defences against the Chinese ships which had ventured within range. At Port Arthur in 1904 the Japanese avoided risk to their ships by opening fire between 13,000 and 14,000 yards, with the result that they achieved nothing.

The two instances in which ships guns were successful against shore batteries were Alexandria and Sfax. In the former the Egyptians were ignorant of the use of heavy rifled guns; in the latter the defences were negligible.

This brief review of the history of the coast defence gun brings us to the last war, in which its superiority was confirmed. It is unnecessary to disturb the soil of a separate controversy, the Dardanelles; it will suffice to say that the ships, admittedly handicapped by the presence of mines, were unable to quarrel on equal terms with the forts, and that Admiral Duckworth's views on ships versus the Dardanelles defences, written one-hundred-and-eight years previously, were confirmed.[1]

[1] "I must declare it to be my decided opinion that without the co-operation of a powerful body of land forces it would be a wanton sacrifice of the squadrons of both nations to attempt to force the passage."—Admiral Duckworth, H.M.S. "Royal George," off the Dardanelles, 10th March, 1807.

Experiences off the Belgian coast were a further recognition of the inability of sea-going ships to dispute with shore batteries. After the bombardment of the Belgian coast batteries on 7th September, 1915, Admiral Bacon wrote: "The net results of the day were one or more hits on Ostende dockyard, while the Westende batteries were also annoyed. My views as to the uselessness of ships bombarding under modern heavy gunfire, which previously had been theoretical, were confirmed. The German communiqué, for once, was correct when it stated that our ships were driven off by the shore batteries."[1]

Later still, the fire of the French and Spanish ships against the hastily improvised Riff coast defences at Alhucemas in September, 1925, were wholly unproductive.

Apart from the Dardanelles and the Belgian coast, the Great War affords no examples of the predominance of the shore gun over the floating gun, nor, with one isolated exception in the Indian Ocean, is there any example of attack on British coast defences. This, however, is no argument against the gun. On the contrary, it proves our coast defences to have been adequate for their purpose, that is to say, they were a successful deterrent. "The primary object of coast defence artillery," writes General Brind, "is to deter the enemy from bombarding or attacking the vulnerable points it is designed to protect, in fact to make the game not worth the candle, and the existence of the defences is fully justified if the enemy is prevented from even attempting to damage the ports and bases they are there to defend."[2]

The reason for the superiority of the shore gun is not far to seek. It has been admirably summarised by Admiral Mahan when he says that "ships are unequally matched against forts in the particular sphere of the fort. The quality of one is ponderousness enabling great passive strength; that of the other is mobility."[3] The relative merit of the two has not altered throughout naval history, and there is no reason to suppose that it will in the future. "As the range of the ship's gun has increased, so has that of the shore gun; the relative power of each is unchanged, whether they are 12-pounders, 42-pounders or 15-in. The shore gun, then, had the advantage in laying, so it has to-day. The targets which must be hit are still the gun on shore: a very small object, and the whole ship at sea: a very big one."[4]

The foregoing examination and the opinions of those qualified to judge reveal that the shore gun has proved adequate to the task of

[1] "The Dover Patrol, 1915-17," page 89. Admiral Sir R. Bacon.
[2] "Journal of the Royal Artillery," page 6, Vol. LIII.
[3] "The Influence of Sea Power on History," Vol. II. Admiral A. T. Mahan.
[4] "National Policy and Naval Strength," page 264. Admiral H. W. Richmond.

resisting bombardment from the sea, and is, therefore, an effective deterrent.

V. The Gun—To-Day.

If, then, history proves the gun to be adequate, why seek a substitute? Briefly, the answer lies, primarily in terms of money and, secondly, in terms of mobility and new forms of attack.

But before examining the limitations of the heavy coast defence gun it is necessary to dispose of the contention, by no means uncommon, that modern coast defence artillery is incapable of hitting the target. Up to 1918 this contention had never arisen, nor could it reasonably have done so in the face of history. Since the war, however, experiments have been carried out which at first sight appear to reflect adversely on the accuracy of the shore gun. These experiments, however, have really proved that with a modernized system of fire control the coast defence gun will be efficient.

But though the 15-in. gun can certainly hit its target, if applied by proper methods, it has certain limitations involving further expense. Prominent among these is the fact that it has outrun local eyesight and, therefore, aircraft observation has become essential to hitting at long ranges.

Again, the entire tendency of modern armaments is towards increased mobility; this is plainly to be seen on land, on sea and in the air. To such tendency the big coast defence gun with its concrete emplacement runs counter, for it is the antithesis of mobility. This fact alone demands serious consideration before large sums of money are invested in weapons which may never be used, or of which, perhaps, it would be more accurate to say they may never have the opportunity of exercising their deterrent influence.

Another example of the difficulties to which the big gun may lead is afforded by the defences of the Firth of Forth. The guns were installed in the vicinity of the bridge, but as the fleet grew in size it became apparent that there was insufficient room on the inner side of the Firth, i.e., above the Bridge. In spite of this, the Government, in 1912, refused on the grounds of expense, to sanction the movement of the guns. This decision left the fleet unprotected, and the money spent on the gun defences totally wasted.

Thirty years ago the British Empire could have afforded to lock up money on defences which might never deter, and to indulge in similar comparative extravagances. To-day, if a mobile alternative can be found, economy demands that it be employed. The money required for modernisation of coast defence would be welcome to the War Office

for experiments in mechanization, or to the Admiralty for fleet purposes, if some cheaper form of defence can be found: a form of defence which can be relied upon as a deterrent against attack in time of need, and which can be moved elsewhere for the defence of other bases in the event of war with some other Power in another part of the globe. Whether such an alternative exists or not it is our purpose to enquire.

Meantime, there remains for examination a third limitation to the big gun, namely that it can be confronted by a form of attack against which it is ineffective, i.e., air attack. If a base is defended by 15-in. guns it is reasonable to suppose that hostile vessels of every class will give it a wide berth, but there is no reason to suppose that an attack or series of attacks will not be launched from aircraft carriers cruising one hundred miles out at sea. The only risk which will deter a hostile fleet from this form of attack is risk to the carriers, and no such risk exists in the circumstances outlined. That there is risk to the attacking aircraft from anti-aircraft fire is unquestionable, but it is more than justified by the possible results of the attack or attacks.

Examination so far, then, leads to the following conclusions. History supports the view that the big coast defence gun is an effective deterrent against most forms of attack. Against air attack, however, it is powerless. It requires air observation to be effective against ships, and, in that it is immobile, it is liable to lock up large sums of money in a distant part of the world which may never be the scene of a war in which the British Empire is involved. Whatever the conditions of the past, the state of our finances to-day forbids the erection, in numerous parts of the world, of steel and concrete monuments to our determination to deter.

Before passing to the potentialities of the aeroplane in coast defence it is necessary to consider another form of gun defence which must play an important part in the coast defence of the future: the anti-aircraft gun.

VI. The Anti-Aircraft Gun.

Since the war great strides have been made in the development of aircraft for military purposes, but for obvious reasons less has been heard of the development of the anti-aircraft gun. Statistics concerning anti-aircraft fire based on the experience of the last war are, unless carefully examined, liable to mislead, in that they frequently do not differentiate between barrage fire and aimed fire.[1] There is little doubt

[1] It has been stated that in the German air raids on England in 1917 and 1918 it took 11,724 shells to bring down one aeroplane. But this figure ignores the fact that the fire in question was usually barrage, and not aimed fire. A more accurate picture can be obtained from the following figures, based on anti-aircraft fire in France in 1918:—

British:—One aeroplane brought down per 4,550 rounds.

French:—One aeroplane brought down per 7,000 rounds. (This figure probably includes the barrage fire of the Paris defences).

American:—One aeroplane per 605 rounds. (This figure is that for the best battery in the A.E.F., even so it is somewhat remarkable).

that since the war, and particularly in the last few years, under the influence of new height, speed, and direction-finding instruments, immense strides have been made in the science of anti-aircraft gunnery. On the other hand, it is reasonable to assume that a target capable of three-dimensional movement will always have an advantage over a semi-fixed gun, and that therefore, the anti-aircraft gun alone, although it will undoubtedly account for aircraft, is unlikely ever to prevent air attack. In a word it lacks deterrent power, for it is an axiom of air power that anti-aircraft fire alone will not prevent a determined attack from reaching its objective.

VII. The Aeroplane.

It has been shown that the scale of attack to which a port is exposed fixes the degree of fortification according to its importance. But if an authority declares the fortification of any port to be insufficient, it is much harder to prove that it is sufficient than that it is insufficient, for, as Admiral Colomb wrote, " there is nothing between a light battery and a first-class fortress."[1] How much harder a task is it to prove that the aeroplane, untried in coast defence under war conditions, is sufficient, when some authorities declare it to be insufficient! Trial under war conditions is the only real proof; without it, at best, a logical argument is all that can be presented. But, on the other hand, it would be not unfair to quote the case of Iraq, where to-day the country is controlled by a military and air garrison which is less than half that originally thought to be fantastic. This fact, and others which could be quoted, admittedly do not prove the question now at issue, but they are encouraging.

Before examining the part of the aeroplane in coast defence it is necessary to be clear on certain points which affect the argument, namely:—

(i) That the role of aircraft in coast defence is not necessarily universal; what might apply, for example, to Singapore would not necessarily apply to Malta.

(ii) That it is no part of the ensuing argument to prove that the aeroplane is a substitute for the small armament of all bases.

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[1] " Essays on Naval Defence," page 166. Admiral Colomb.

(iii) That the ideal deterrent is the big gun and the aeroplane, and that but for the urgency of economy it would be unnecessary to suggest the substitution of the one for the other.

The big gun in coast defence has a range of about nineteen miles, within which distance, with air observation, it acts as a successful deterrent against bombardment by hostile vessels. The aeroplane in coast defence can be regarded as a gun with a still larger range, capable of delivering a projectile against hostile vessels up to a range of, at present, some 200 miles. Up to this point there exists no difference of opinion. It is on a question, first, of the accuracy of the aeroplane that difference of opinion has arisen. If the sceptic can be convinced on this point, however, the argument is by no means over, for it is then argued that, even if the aeroplane can drop its projectile with accuracy, it will have little effect on the ship.

Now, unless it can first be proved that the air projectile can be discharged with reasonable accuracy against the target, there are no grounds for the belief that the presence of aircraft at a naval base will deter an enemy from attack. In the late war, the bomb, the natural weapon of the aeroplane, was not accurate. This must be admitted; but it must equally be admitted that bombing had not been scientifically studied, and that there was, therefore, little more reason to expect accuracy in an aircraft bomb in 1916 than there was to expect accuracy in an arquebus in the XVIth century. As a consequence of this inaccuracy the tendency after the war, in fleet aviation, was to abandon the bomb in favour of the torpedo. That this has been done with considerable success is clear from the results of air torpedo attacks on the fleet carried out since 1921. The percentage of hits obtained compares reasonably even with those secured by the German submarines in their attacks on merchant ships. These exercises, carried out under peace conditions, suggest that the aircraft torpedo can be discharged with considerable accuracy, and that if, as is the accepted figure, six hits will put a battleship out of action, there is every reason to suppose the torpedo-bomber to be a deterrent in coast defence. There is, however, a grave objection to accepting these figures as conclusive, namely, that the ships attacked could only exercise passive defence measures such as turning away. If the ships had been able to use their H.A. armament the figures would doubtless require considerable modification. Against this, on the other hand, it must be remembered that the surprise factor was denied to the aircraft, and that, given surprise, the ships would have but a short time in which to bring the H.A. armament into action. For example, even if the attackers are sighted ten miles away, the ships have but five minutes in which to engage them; moreover, the aircraft will be within range of the H.A. armament for not more than sixty seconds.

The real objection to the torpedo as the weapon of air attack at sea is that, in order to deliver the projectile against the target, the aeroplane is compelled to descend almost to the level of the sea, and in so doing it sacrifices the principal advantage that the aeroplane enjoys: its three dimensional mobility. For a moment in torpedo attack, however short, the aeroplane becomes a two-dimensional weapon, and is, therefore, reduced to almost equal terms, in space, with its adversary, and this is the period during which the H.A. armament is expected to operate effectively.

The possibilities of torpedo attack on a fleet at sea is a subject for further investigation of which space forbids. The fact that in peace time the fleet is unable to defend itself will always lead to difference of opinion as to whether or not a reasonable percentage of hits can be obtained under war conditions. The matter is one which can only be decided in war; meantime, individuals will cling to their own conclusions. The writer believes that torpedo aircraft, though they will suffer casualties, have the ability to score such a percentage of hits that any Admiral would hesitate to take his ships within their radius of action for the purpose of bombarding a base. Risk in bombarding a base and risk in a fleet action are two totally different things.

But, though it is believed that the torpedo would prove an effective deterrent in coast defence, it is considered that the true weapon of the aeroplane in this role, as in others, is the bomb. It is argued that it can be developed into a more effective deterrent, and that it can be employed with less risk to the aeroplane and greater effect against the ship. In using it the aeroplane retains its three-dimensional advantage, and presents a difficult target to the anti-aircraft guns of the ships firing from unstable platforms. In destructive power, too, the bomb enjoys distinct advantages over the torpedo. Six of the latter are required to put a battleship out of action; three 2,000 lb. A.P. bombs can achieve the same effect. Bombs of this size do not exist at the moment, but their design offers no difficulties; much larger bombs were produced during the war. An aircraft exists capable of carrying twenty 2,000 lb. A.P. bombs a distance of 200 miles at a speed of 105 m.p.h.[1] It would seem, however, that the ability of the big bomb to put a battleship out of action will not be generally accepted until the question has been put to the test on a moving ship. Whether H.M.S. "Centurion" or some other ship can ever be made available for this purpose is a matter on which no opinion is offered, but it will be unfortunate if practical tests cannot be carried out.

There remains the question of accuracy. The war and the years immediately following the war discredited the bomb as a weapon of

[1] The Dornier, DO-X. See R.U.S.I. JOURNAL, November, 1929, page 771.

accuracy; but while the torpedo was being developed the study of bombing was not neglected. The whole subject was re-opened *ab initio* on a scientific basis; new instruments and new bombs were designed and produced, with the result that to-day the bomb can compete in accuracy with the big gun. That this is so is proved by the recent "Centurion" trials. In these trials the percentage of hits obtained by the two bombing squadrons exceeded that obtained either by ship or shore guns against the same target. Moreover, it should be remembered that these results have been obtained after only some five years' study of, and practice in, the science of bombing.

Though the data are not extensive, it may be of interest at this point to quote foreign opinion on the possibilities of aircraft in coast defence.

Following experiments[1] carried out in the summer of 1921 by the United States, the Joint Board of the Army and Navy reported:—

(*a*) "That aircraft have marked ability, either in combination or singly, to locate naval vessels operating within their radii of action.

(*b*) "That it is believed that an effective percentage of hits can be obtained against surface vessels coming within their radii of action.

(*c*) "That aircraft, carrying high capacity high explosive bombs of sufficient size have adequate offensive power to sink, or seriously damage, any naval vessel at present constructed."

The French Admiral, Guepratte, has stated that the coast defences of France could be adequately assured by aircraft, and that it is incorrect to suppose that a coast must be defended by artillery equal in power and range to that of battleships.[2]

Spain, on the other hand, believes in the 15-in. gun, and is now re-arming her shore batteries at Ferrol, Corunna, Cartagena and the Balearic Islands with these guns, of which she has purchased eighteen.

It is sometimes said that, granted the ability of aircraft to deter attack or to punish the attacker, there are certain weather conditions in which they may not be able to operate at all. The only weather which will prevent the operation of land-based aircraft is fog, but fog will also prevent bombardment by hostile ships. In any event, the

[1] These experiments consisted of air attacks on the light cruiser "Frankfurt" and the battleship "Ostfriesland." Both were sunk by bombs, the former in twenty-one minutes, the latter in twenty. They were, however, undefended, stationary, and without pumps. On the other hand, the boilers were without steam, and the condensers inoperative. The observers of the trials, on whose report the Joint Board based their views, were three senior naval officers, two senior army officers and General Pershing. Neither the Army Air Service (which did the bombing) nor the Navy Air Service were represented; this fact lends weight to the disinterestedness of the Report.

[2] Speech in the French Chamber, February, 1921.

aeroplane is being examined as a substitute for the big gun, which itself requires air observation; in these circumstances the argument hardly arises. Again, it may be asserted that hostile vessels may take advantage of the weather conditions to come close inshore. But in actual fact what Admiral would take his ships into an area, probably mined, for the purpose of carrying out a bombardment, when weather conditions forbid accuracy of gunfire?

It is said that surprise attack may catch the air defences of a port unprepared. For example it is asked whether air defences could stop the Mediterranean Fleet appearing suddenly off Toulon, firing a thousand rounds, and being away again in fifteen minutes? Air defences could certainly deter an operation of this sort by locating and subsequently attacking the fleet, either before the ships were within range of Toulon or, alternatively, but less desirable, afterwards. Certain it is that guns, except on a prodigious scale, could not stop it.

Could aircraft have prevented the Zeebrugge attack? In the exact conditions of time and space under which that operation took place they could not, but neither could nor did the gun defences stop it. To-day an operation of similar type in the face of efficient air reconnaissance and air defences would be unlikely to succeed.

Against night bombardment of a defended port the big gun is useless, particularly as it is dependent upon air observation. Aircraft, on the other hand, can either attack the enemy before he arrives and before darkness, or alternatively, after he has left and after dawn. The enemy vessels are bound to be within the radius of the defending aircraft in daylight, either before dark or after dawn, sometimes both, according to the part of the world or the period of the year; this will be increasingly so as the radius of action of aircraft increases. In the case of night bombardment, therefore, the aeroplane is a deterrent against attack; the big gun is not.

VIII. Deterrent Power.

Deterrent power, however, is not confined to the infliction of damage; it also implies instant readiness for action. In the preceding section it has been shown that aircraft have the ability to locate, attack and injure enemy vessels, and so possess one essential of deterrent power. It is for examination whether they have the other requisite—instant readiness for action.

Under modern conditions of international relationship "the bolt from the blue" may reasonably be relegated to the past, and it may be assumed that a sudden and unprovoked attack on a British base in time of peace is a contingency so remote that it need not be provided

against. It follows, therefore, that a period of strained relations, during which preparations can be made, will precede any sudden act of war. During that period, however short, aircraft can be placed in a state of instant readiness for action. That this is so is proved by the exigencies of the defence of London. For reasons of time and space, which need not be examined here, it is necessary that the fighting aircraft of the defence should be patrolling at a height of 16,000 feet within twenty-five minutes of the alarm being given. This has been done, and is part of the standard training of fighting squadrons. On receipt of the alarm, pilots have proceeded to their aircraft, started and warmed their engines, taken off and been patrolling at 16,000 feet, all within twenty-five minutes. This is a state of readiness comparable with that of a fire brigade, and is one which the requirements of coast defence do not necessitate. It will, therefore, be conceded that aircraft possess instant readiness for action.

But arising out of the main controversy as to the role of aircraft in coast defence is a lesser controversy which bears on this subject. It has been contended that not only have aircraft the ability to defend a base, but that there is no reason why they need be permanently stationed in its vicinity. At first sight this contention is attractive, because it opens up fresh avenues for economy. But it must be remembered that statesmen have a marked aversion to any obvious movement of forces, even for purely defensive purposes, at a time when relations are strained, and which might compromise their efforts towards peace. There is, therefore, the danger, if aircraft are not kept permanently at the most vital places, that when required they will not be there in time.

In the case of a first-class naval base where big issues are involved, the principle must, for the present, be accepted that the defending aircraft must be stationed in its vicinity, and only moved temporarily elsewhere after the proposed move has, on each occasion, been examined in relation to the existing international situation. As aircraft improve in performance and range, this conclusion may quite possibly be modified. Meantime, security should not be staked, even in appearance, on too nice a calculation of chances.

IX. Reservations.

Up to this point the endeavour has been to show that aircraft can be regarded as an economical and effective substitute for the big gun as a coast defence weapon. The arguments have been deduced primarily with a first-class naval base, such as Singapore, in mind. It will be recollected, however, that the reservation has previously been made that the aeroplane is not considered as a substitute for smaller coast defence

armament, such as 6-in. guns, and that the role of the aeroplane in coast defence is not necessarily universal.

(*a*) *Minor Coast Defence Armament.*—Where the Admiralty rate the probable scale of attack on a port so low that it can be met by an armament of 6-in. guns, it would obviously be uneconomical to employ aircraft for its defence. Guns of this calibre are much less expensive to make and to instal; they do not necessarily require air observation; moreover, where the scale of attack is rated so low, there is no reason why, in most instances, the defences should not be manned by a volunteer corps under a small regular cadre. To substitute aircraft in these circumstances would be to send a man on a boy's errand.

(*b*) *Role of aircraft not universal.*—Marshal Foch has said that in war there are only particular cases,[1] by which he implied that general principles may be useful, but their application is so varied that each case must be stated in precise and particular terms.

Though aircraft may be a substitute for the big gun in the defence of a base such as Singapore, it by no means follows therefrom that aircraft should be installed for the defence of all bases of immediate naval importance. Each base, on the contrary, must be considered on its merits. In some it will be found that geographical and other conditions either prohibit the aeroplane or render its use economically undesirable. A survey of all bases of importance is outside the scope of this paper; a few examples must suffice:—

Gibraltar.—Though more exposed to air attack than almost any other British naval base, its surroundings forbid the use of aircraft on an adequate scale for its defence. Coast guns and anti-aircraft guns must always be the primary defence of Gibraltar.

Malta.—Like Gibraltar, though on a lesser scale, Malta is exposed to land-based air attack. As adequate gun defences already exist, it would be illogical to suggest that aircraft be substituted for them. They must, however, be supplemented by aircraft to deter air attack, whether land-based or sea-borne, and to spot for the guns.

Aden.—As a fleet refuelling base Aden is adequately protected against any probable scale of attack. In any event, a squadron of aircraft is permanently stationed there to ensure the security of the Protectorate; the squadron can be used to supplement the gun defences should the necessity arise.

Hong Kong.—The seaward defences of this base are governed by Article XIX of the Washington Agreement.

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[1] "Des Principes de la Guerre." Marshal Foch.

From the foregoing examples it will be seen that the role of aircraft in defence of bases is one which must be examined in its relation to each base. For some, it is suggested, aircraft are an adequate defence; for others a combination of guns and aircraft is desirable; for others, again, aircraft may be unsuitable.

X. The Dominions.

The problem of the defence of the coasts of our Dominions is one which requires separate consideration. The answer, whatever it may be, is definitely awaited by at least one Dominion, Australia.

It is not proposed to examine in detail the question of Canadian coast defence, seeing that Canada looks largely for security against external attack to the Monroe Doctrine, "behind which," as Sir Frederick Borden said, "were the guns and warships of the United States and the whole power of eighty million souls."[1] Nevertheless, Vancouver seems ideally placed for the use of aircraft against sea bombardment On the eastern coast fog secures immunity to Halifax for nearly half the year.

South Africa is not at present exercised in the matter of coast defence. Nevertheless, Durban is a port whose defence must sooner or later require consideration by the Union Government. It is suited to defence by aircraft; moreover, useful employment in peace can be found within the Union for the aircraft allotted to its defence. It is a base the importance of which is unlikely to demand that its air defences be permanently stationed in its vicinity in time of peace.

The coast defence problems of Australia and New Zealand have much in common. Both have extensive coast lines; the principal cities of both are on the coast; both are nervous about their isolation; both are young countries in which money is sorely needed for economic development, and, therefore, both have but little money to spend on defence generally. Both Australia and New Zealand recognize that their best interest lies in contributing to the strength of the Empire's sea power, upon which the security of their coasts ultimately rests. Thus there is little money available for coast defence. At the same time, both countries are acutely aware that there are times, particularly immediately after an outbreak of war, when their coasts might be bombarded by an enterprising enemy.

In addition to her contribution to the Imperial Navy, can Australia, to take three examples only, afford to instal big gun defences at Sydney, Melbourne and Fremantle? It is quite evident that she cannot. And if these ports, why not Adelaide, Brisbane and Newcastle? These places will certainly demand that they have an equal right to protection.

[1] Speech at Ottawa, 23rd February, 1906.

It is not suggested that air defence will provide an answer to the security of the entire Australian coast; distances are too great to concentrate air strength in a central position from which it can strike at will. But it is contended that the very vastness of the distances involved demand the maximum mobility, and only aircraft can provide that mobility. Australia has already sanctioned an increase of her sea strength; she is a country which can make use of aircraft in peace for peaceful purposes. It is clear that aircraft are the nearest solution to her coast defence problem. She cannot afford cruisers, aircraft and big guns; she can afford cruisers and aircraft.

The cities of New Zealand, the chief centres of supply and industry in that country, are all located on the coast. There exists in the minds of New Zealanders the possibility of their economic life being dominated by the guns of a hostile fleet. However short the ordeal, and however remote the contingency, New Zealanders do not like it. New Zealand is, as it happens, peculiarly suited to the use of aircraft for coast defence. There is no point of importance, either in the North or South Island, which is distant more than four hours' flight by aircraft based in the vicinity of Wellington. Thus, in view of the small scale of attack probable, two squadrons of bombers at Wellington would meet the coast defence requirements of New Zealand.

The Dominions await the solution of the coast defence question. It is suggested that, in so far as it is possible to generalise, the answer lies in the aeroplane. It is a mobile weapon which is what the Dominions require, and it is economical in relation to its offensive power. Moreover, it can be used by them for peaceful purposes when not required for war; to the truth of this statement the Royal Canadian Air Force bears witness. Every penny saved on defensive insurance can help to relieve the burden borne mainly by the United Kingdom in maintaining sea power.

XI. Indiscriminate Coast Bombardment.

It has been asserted by an eminent military thinker that the ability of a centrally-situated air force to deter an enemy from sea bombardment has been disproved by the experience of the war. "The German raids on Hartlepool, Scarborough and Margate," he writes, "succeeded in spite of large forces of aircraft in this country, since time was insufficient for them to concentrate. If this was the case when aircraft were within easy reach, how much more is it likely to be the case when distances run into hundreds of miles?"[1]

This argument lacks conviction because the data upon which it is founded are inaccurate. In the first place, there were not large forces

[1] "On Future Warfare," page 206. Colonel J. F. C. Fuller.

of aircraft in England at the time. During the bombardment of Hartlepool and Scarborough (December, 1914), there were not fifty serviceable aircraft in the country, apart from training machines. In the second place, aircraft had not been seriously considered as a means of coast defence. It was never a question of insufficient time to concentrate. No effort was ever made to concentrate aircraft against German ships bombarding our coasts, nor, supposing a concentration affected, could the aircraft have accomplished anything, seeing that the pilots were untrained and the machines unequipped for the purpose. The same applies to the Austrian bombardments of the Italian coast.

This question of the bombardment of open coasts, though illegal, is one which cannot be lightly overlooked. The limits of what is permissible in war are, unfortunately, widening steadily. The fact that certain courses of action are repugnant to British traditions affords no ground for the belief that they will be seen from a similar high plane by other nations. Moreover, the bombardment of open coasts may have a definite military value. The fear of it and the consequent uneasiness of American public opinion handicapped Admiral Sampson's movements in the early part of the Spanish-American war. The German bombardment of our open coast towns in the last war achieved a definite military object. "One other factor," writes Lord Jellicoe, "exercised a cramping effect upon our strategy throughout the war, namely, the bombardment of our undefended towns on the East coast."[1]

This method of reducing the initiative of an enemy fleet is more than likely to be employed again in the future, particularly by a weaker fleet, and, therefore, particularly by any fleet opposed to the British. It is obvious that this form of intimidation cannot be met by gun defences. Whether it is in New Zealand or in the United Kingdom or elsewhere, it is clear that the only answer is the aeroplane, the presence of which will deter the enemy and "make the game not worth the candle."

XII. Raids.

However powerful its seaward defences, history has shown that the weakest point in a fortified naval base is usually its land side. Provided that it keeps outside the range of the seaward defences, some twelve miles, a raiding force escorted by naval craft can disembark with impunity, and is then less than a day's march from the fortress whose armament can offer little resistance. To a strong force so landed, a base is as vulnerable "as a hedgehog on its back."[2] For this reason

[1] "The Grand Fleet, 1914–16," page 25. Lord Jellicoe.
[2] "Coast Artillery Journal," October, 1928.

it is necessary to supplement the fixed defences with a military garrison adequate to the probable scale of attack. In time of peace, these fortresses are usually most unsuitable places for troops, whose training suffers thereby. In time of war, these garrisons eat into our striking force; every soldier employed on garrison duty is a bayonet lost to the main theatre of war. It is realised, however, that the use of aircraft to replace troops can be carried to a point at which the economy becomes false. That point is when reduction commences to re-act on the Cardwell system, on the maintenance of which the strength of the Expeditionary Force depends. Any action which reduces the strength of the Expeditionary force below its present minimum is false economy, for the Expeditionary Force exists to perform functions which aircraft alone cannot perform. If this fact is always borne in mind, there seems no reason why garrisons should not be reduced in time and Army training benefited thereby.

Aircraft can assist the Army in the land defence of a fortress, both directly and by raising the distance at which the raiding party must land from the range of the gun, twelve miles, to the radius of the aeroplane, two hundred miles. Two hundred miles from its objective a raiding party is faced with a very different task, upon which it is unnecessary to enlarge. Any attempt to land within the range of aircraft is to invite failure. It is remarkable how easy it is to upset a landing expedition consisting, as it does, of merchant shipping, with soldiers on an unaccustomed element about to land on a strange shore. A few fireships in the roads of Calais caused the terror-stricken "Armada" to cut its cables and risk destruction from English guns and Dutch shoals. A few innocuous shots from a French field battery at Corunna in 1809 caused a panic among the English troopships that might well have proved destructive. That a landing by enemy troops in the face of air opposition would be a delicate operation is indisputable. An attempt to land by night or in a fog in order to avoid aircraft is unlikely to commend itself either to soldiers or sailors as a practical proposition.

On the whole it can be stated with confidence that troops cannot be put ashore under weather conditions in which aircraft cannot operate. Assuming, therefore, a regular system of air reconnaissance, supplemented by other means of intelligence, it is probable that an attempted landing would be observed, and that it would be interrupted by aircraft before any appreciable number of troops could be disembarked on an open beach. A landing outside the range of aircraft is unlikely to succeed in its object for reasons of time and space.

Aircraft employed in the defence of a fortress, therefore, have the additional advantage that they strengthen the most vulnerable side of the majority of naval bases.

XIII. Summary.

Examination has revealed that the big gun exercises, and will continue to exercise, deterrent power against most forms of attack, provided that it is equipped with observation aircraft; but so also, it is contended, does the aeroplane. The gun is powerless against carrier-borne air attack. No Admiral, on the other hand, will lightly lay his carriers within range of shore-based air attack. The gun is immobile; the aeroplane is essentially mobile, and mobility is the keystone of war as it is foreseen to-day. The gun cannot protect open coast towns; the aeroplane can, within its radius of action, which to-day is approximately 200 miles;[1] less than six years hence it will be 500 miles. The gun can only prevent a landing by an enemy force within 12 miles; the aeroplane extends this distance to 200 miles. The gun cannot protect the land side of a base; the aeroplane can assist the Army to do so. The big gun is a highly expensive form of insurance; the aeroplane, relatively to its destructive power and mobility, is inexpensive. The aeroplane can fulfil a dual role, the gun can only fulfil one. If the big gun is installed for the protection of a base in the Mediterranean and war breaks out in the Pacific, the gun is useless, because it is a deterrent where there is nothing to deter; the aeroplane can be moved to the area of hostilities. On the other hand, to substitute aircraft for small fixed armaments would not be economical in most cases; moreover, the substitution of aircraft for big gun defences cannot be laid down as a principle; the defence of each particular base must be examined on its merits. Finally, for the defence of a first-class naval base, the aircraft, in the present stage of their development, should be stationed in the vicinity of the base they are intended to protect.

XIV. Conclusion.

"Captains of Industry," we are told, "are built on a perception of the advantages of combining related undertakings, coal with iron, both with transport, and so on."[2] The aim of this paper has been to examine the possibilities of aircraft in coast defence, not as a role in itself, but as part of a wider role, namely, the assistance which aircraft can give to the Navy and Army in shouldering the burdens of Imperial Defence in these days, when money is scarce and universal war-weariness leads the world fondly to imagine that international legislation can make war an anachronism.

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[1] The radius of the standard existing heavy bomber is 400 miles; in order, however, to cover all forms of existing bombers, the figure of 200 miles has been taken as the present radius of action.

[2] "The Soul and Body of an Army," page 246. Sir Ian Hamilton.

The Pact of Paris outlaws war except in self-defence. Such a reservation, however, necessarily implies aggression on someone else's part. The League of Nations, on the other hand, all of whose members signed the Pact of Paris, permits war under Article II of the Protocol. The truth is that neither the Pact of Paris nor the League of Nations can prevent war, but they do serve the fine purpose of making war more difficult. Unfortunately, they make more difficult also the task of those on whom responsibility for the defence of this Empire rests. This difficulty is apparent in the increasingly vigorous reduction to which defence votes are subjected. In times such as the present, therefore, it is essential that the activities of all three Services be correlated to derive the maximum advantage from the limited funds available.

If, as the writer believes, aircraft have the ability to protect a first-class naval base, such as Singapore, and can do it at less expense, then they should be given the task, and the money so saved devoted to other defence purposes. If, on the other hand, their ability to fulfil this role is not universally accepted, practical experiments should be continued to decide the question one way or the other.

The Navy, the Army and the Air Force are related undertakings; the measure of their success must depend on whole-hearted co-operation. The more mobile the combined efforts of the three Services, the greater is their value to the Empire. Mobility gives economy in peace and success in war; the case against immobile defences is clear. It is on a proper appreciation of these factors, now that naval parity has been accepted, that future efficiency depends. The role of the aeroplane in coast defence, therefore, is to provide reliable but economical assistance to the Royal Navy and sea power, upon which, in the issue, the future of the Empire rests.

REFEREES REPORT.

The Referees, in reporting on the essays submitted for the 1929 competition, said :—" We are of opinion that the Essay which we have recommended for the Gold Medal reaches a standard which well merits the award of the Medal. At the same time, we wish it to be clearly understood that the views therein expressed do not meet with our unanimous approval. We feel, however, that for clarity, logic and moderation of expression, it is undoubtedly the outstanding Essay of the year, and we have, therefore, recommended it for the highest award. We hope that the Institution will find it possible to give equal publicity to the second essay, which presents another view of the subject."

The Council, in awarding the Gold Medal and Trench Gascoigne Prizes, approved the publication of this report, and directed that the second essay should appear in the next issue of the JOURNAL.

RECIPIENTS OF THE ROYAL UNITED SERVICE INSTITUTION GOLD MEDAL

(With rank of Officers at the date of the Essay).

1874 Captain H. W. L. Hime, R.A.
1875 Commander G. H. U. Noel, R.N.
1876 Lieutenant J. F. G. Ross of Bladensburg, Coldstream Guards.
1877 No Medal awarded.
1878 Major T. Fraser, R.E.
Captain E. Clayton, R.A.
1879 Captain The Hon. E. R. Fremantle, C.B., C.M.G., A.D.C., R.N.
1880 Captain J. K. Trotter, R.A.
1881 Captain L. Brine, R.N.
1882 No Medal awarded.
1883 Captain C. Johnstone, R.N.
1884 Captain G. T. Browne, Northamptonshire Regiment.
1885 Lieutenant F. C. D. Sturdee, R.N.
1886 Captain C. E. Callwell, R.A.
1887 No Medal awarded.
1888 Captain J. F. Daniell, R.M.L.I.
1889 Captain H. F. Cleveland, R.N.
1890 Captain G. E. Benson, R.A.
1891 Captain R. W. Craigie, R.N.
1892 Lieut.-Colonel J. Farquharson, C.B., R.E.
1893 Commander F. C. D. Sturdee, R.N.
1894 Major F. B. Elmslie, R.A.
1895 Commander J. Honner, R.N.
1896 Captain G. F. Ellison, Queen's Royal West Surrey Regiment.
1897 Commander G. A. Ballard, R.N.
1898 Captain W. B. Brown, R.E.
1899 Commander G. A. Ballard, R.N.
1900 No Medal awarded.
1901 Lieutenant L. H. Hordern, R.N.
1902 Major A. H. Terry, A.S.C.
1903 Lieutenant A. C. Dewar, R.N.
1904 Lieut.-Colonel C. E. D. Telfer-Smollett, 3rd Bn. South Staffordshire Regiment.
1905 Major W. C. Bridge, South Staffordshire Regiment, *p.s.c.*
1906 Lieutenant B. E. Domvile, R.N.
1907 Lieut.-Colonel A. F. Mockler-Ferryman, Reserve of Officers.
1908 Major A. B. N. Churchill, R.G.A.
1909 No Medal awarded.
1910 Captain P. W. Game, R.H.A.
1911 Captain H. T. Russell, late R.G.A.
1912 Commander K. G. B. Dewar, R.N.
1913 Major A. Lawson, 2nd Drags.
1914–15–16–17 No Medals awarded.
1918 Lieutenant W. S. R. King-Hall, R.N.
1919 Colonel J. F. C. Fuller, D.S.O., Oxford & Bucks L.I.
1920 No Medal awarded.
1921 Flight-Lieutenant C. J. Mackay, M.C., D.F.C., R.A.F.
1922 Major R. Chenevix-Trench, O.B.E., M.C., Royal Corps of Signals.
1923 Captain A. H. Norman, C.M.G., R.N.
1924 Major L. I. Cowper, O.B.E., King's Own Royal Regiment.
1925 Lieut.-Colonel J. C. Dundas, D.S.O., Royal Tank Corps.
1926 No Medal awarded.
1927 Colonel H. Rowan-Robinson, C.M.G., D.S.O., R.A.
1928 No Medal awarded.
1929 Wing-Commander C. J. Mackay M.C., D.F.C., R.A.F.

RECENT ECONOMIC DEVELOPMENTS IN THE DOMINIONS, COLONIES AND MANDATED TERRITORIES

By the Rt. Hon. Sir Halford Mackinder, P.C.

(*Chairman of the Imperial Shipping and Imperial Economic Committees*).

On Wednesday, 5th February, 1930, at 3 p.m.

Admiral Sir George Hope, K.C.M.G., in the Chair.

The Chairman: As an eminent geographer, traveller and scholar, nobody, I am sure, could be better qualified to address us on this subject than Sir Halford Mackinder.

LECTURE.

IN what I am going to say, I do not propose to use any detailed statistics. To adopt a current expression I shall state my figures in a "global" way. I shall have to refer to figures of imports and exports. These are of great importance, especially when dealing with the British Empire. But it must never be forgotten how very easy it is to exaggerate their significance. The external trade of practically every country is less than its internal exchanges, and in the case of many countries vastly less. It is only because statistics of imports and exports are generally available that they play such a large part in current discussions. If it were as easy to obtain other statistics, they would be quite as important, and very often more significant.

I am anxious to give a concrete character to what I am going to say. Great generalisations may be necessary for purposes of propaganda, for purposes of political discussion in democratic countries, where the sovereign power resides in all the busy adults, and perhaps also the adolescents, of the nation. But I need hardly say that generalisations are suspect; they are hardly ever completely true. Until the details have been tested it is not justifiable to use global totals.

I am, therefore, going to take four sample communities, chosen because of their typical character, and shall say a few words in regard to each. I omit the mother country and I omit India, because these countries fall outside the scope of the title of my subject.

I will take first New Zealand, because the economic relation between New Zealand and the mother country is of the simplest character. New Zealand has a population of one-and-a-half millions. Only about one in seventeen or eighteen of them is engaged in a factory, and the usual size of the factories is indicated by the fact that on an average they employ only some sixteen persons each. There are, of course, some larger factories, but that is the average figure. The population of New Zealand is in the main of an agricultural and mining character. Except for minor industries, it is a population engaged almost wholly in what is known as primary production.

But the facts are even simpler than that. New Zealand produces enough wheat and oats for her own consumption, but practically none for export. She is a great pasture-land, and her exports to the extent of more than nine-tenths are wool and the produce of dairy cattle. We have, therefore, a people engaged, broadly speaking, in one great staple occupation. The whole of the trade is obviously and necessarily done over the seas; it is carried almost entirely under the British flag, and is insured and financed in London. In the list published by the Economic Section of the League of Nations, showing the amount of external trade done per head of the population in very nearly one hundred countries of the world, New Zealand stands first. She does more importing and exporting per head of the population than any other country in the world. That, of course, results from the fact that of wool and of dairy produce she produces vastly more than is necessary for her own consumption, whereas most of the other necessaries of civilization a very large part is imported from over the seas. New Zealand exports about £50,000,000 worth of goods, and imports about £40,000,000 worth. The difference is accounted for mainly by the cost of carriage and insurance on the ocean, and by interest on external debt.

Therefore, we have still in New Zealand to-day, to all intents and purposes, a fragment of the old country lying moored in the antipodean ocean, a portion of that agricultural land which we should need to add to this country if, with the present scale of our industries, we were to be a balanced and self-contained community.

Very naturally, the most significant recent economic phenomenon in New Zealand has been the formation, partly with statutory powers, of organizations among the producers of the great staple articles of export, organizations for the purpose of what is known as "orderly marketing" over the seas, and principally in the mother country.

There is one other phenomenon to which I would direct attention. Since the opening of the Panama Canal, New Zealand is no longer on a mere branch from the route from this country to Australia. A large

part of the trade of New Zealand goes via the Panama Canal, and owing to the facts that New York lies 10 degrees south of the English Channel, and that the Panama Canal is nearly south of New York, it implies no very great deviation for a ship to call at New York on the road out and home between this country and New Zealand. The practice of so calling is increasing, and this obviously presents a facility for international trade which would not otherwise be forthcoming.

So much for New Zealand, the simplest case remaining to-day of a great white man's colony in temperate regions. Now let me turn to Canada—a far more complex case. There we have to-day some ten million people. It is a very interesting fact that in the list of a hundred nations to which I have referred, prepared by the Economic Section of the League of Nations, showing the amount of external trade done per head in each nation, Canada stands second, second only to New Zealand. That is perhaps a more remarkable fact than that New Zealand should stand first.

Let me examine it a little further. Without quoting all the figures, which are to be found in books of reference, we may make these statements which are "globally" correct. Canada does half of her external trade across the frontier, 3,000 miles long, which separates her from the United States; she does a quarter of this trade with the United Kingdom; she does the remaining quarter with almost every other country on earth. Each of those facts has its significance, and the fact to which I would direct attention more especially is that Canada does one quarter of her trade with nearly every country on earth. That she should do a vast trade with the United States, sending there raw materials, drawing thence manufactured articles, is natural and inevitable. There are large numbers of people who sleep on one side of the frontier and work on the other. In certain districts we may compare the frontier between Canada and the United States with the frontier between Belgium and France. That she should do a great trade with the old country is also natural; we are consumers of her wheat, let alone her other products. But there is a special significance in the fact that she does one-quarter of her trade with pretty nearly a hundred other countries. Her export to those other countries is in part an export of manufactured articles, something totally different from what we have seen in the case of New Zealand.

The proportion of the population engaged upon industry—factory industry—is approximately the same as in New Zealand, but with ten million people that proportion gives you a much greater actual number than with one-and-a-half-million. There, for the first time in what I have to say to-day, we come up against the economic unit of

manufacturing; a unit which differs in different lines of manufacture, but which to-day marks the limit of successful industry in world competition. Six hundred thousand Canadian workers present much greater opportunities for organization on the minimum competitive scale than do ninety thousand New Zealanders. Even so, it is only by concentrating on certain lines that the Canadian manufacturer can cater not merely for the Canadian domestic market, in competition with imports from the United States, Great Britain and other countries, but also in the competitive markets of the world.

To take a striking case, Canada is a very important manufacturer for export of Agricultural Machinery; no small part of that quarter of her production, which I spoke of as being distributed amongst all the countries of the world, is an export of Agricultural Machinery. A fact recorded in the report of the Imperial Economic Committee on Agricultural Machinery is pertinent at this point. Until very recently it was not practicable to make what is known as a reaper-harvester which would operate on a relatively moist crop, and, therefore, since the crops of Canada are not relatively moist except in one corner of the province of Alberta, Canada had small need to manufacture this particular kind of machinery for her own home consumption. In spite of this, however, owing to her enterprise, she made herself the chief producer of that particular machinery for the world. In other words, Canada, in the case of agricultural machinery, has had to do the same thing that Great Britain has had to do on a larger scale and for many commodities; she has had to manufacture types purposely for export, for which there is practically no, or very little, market in the home country. Therefore, we get incipiently a Canada which is passing into the same condition as that reached by Great Britain in maturity.

Now let us contrast the case of the United States. There we have, of course, a vastly greater total production, yet the foreign trade of the United States amounts to less than £20 a head of its population, and that of Canada to more than £57 a head. On the Imperial Economic Committee we have repeatedly had our attention called to the fact, that whereas, if we consider either agricultural production or manufacturing, the vast mass of what is produced in the United States is also consumed there; in the case of Canada (not less than Great Britain), although the home consumption is greater than the export (except in the case of wheat in Canada), yet the proportion is nothing like what it is in the United States.

What is the result? The result is that in the United States a manufacturer can keep his prices fairly level, and can export his surplus, varying according to the harvest and many other circumstances, to

foreign countries at whatever price he can get for it. Even taking the worst that can happen, he gets some compensation for a loss that was otherwise inevitable. But in the case of Canada and in the case of Great Britain the external trade is so considerable in proportion to the production that unless, as producers, we can get a suitable profit on our foreign trade, our whole trade is very seriously damaged and even jeopardized.

Let us consider the Canadian apple trade. The United States produces an enormous crop of apples. A mere fraction of that crop is exported, but that fraction jumps up and down to a very great extent according to the seasons. If we take a normal crop as 100, and then imagine a bountiful season and a crop of 110, we have 10 to export. If we imagine a season of an average character, which produces 102, then, if the home consumption remains about constant, we will have 2 to export. The Canadian position, on the other hand, may be understood if we imagine a total crop of 20, of which 15 is exported and 5 consumed at home. In that case, the 15 exported to the foreign market will have to meet in one year competition from 10, and in another year competition from only 2, as a spill-over from the United States.

Already the external trade of Canada is on a great scale. The trade of Great Britain may be taken roughly at £1,800,000,000 a year; the trade of Canada is about £520,000,000. That is to say, Canada does nearly one-third as great an external trade as does the mother country, although the mother country has a population more than four-and-a-half-times as great. The trade of the mother country is, of course, unevenly divided between import and export; the trade of Canada is more visibly balanced; in other words, Canada has smaller invisible exports.

Thus, with all their great differences, Canada and Great Britain, daughter and mother, exhibit some very remarkable economic similarities. Geographically also, they are not dissimilarly placed. Each has to the South, a vast foreign market with which it does half its external trade, notwithstanding that both those foreign markets are fenced round with tariffs.

It is no lengthy matter to point out the essential features of my third and fourth examples—West Africa and Malaya. They are, both of them, tropical dependencies, but I have chosen them because they present very different conditions.

Malaya has a population of some two or three millions—I include, of course, the Straits Settlements and the Federated Malay States—but she exports to the extent of just about £100,000,000, and imports also about £100,000,000. There is a considerable depot trade, but the

greatness of those figures is in the main due to two great staples exported: rubber and tin, and to imports of food, such as rice. The special point to which I would direct your attention, however, is that only a very small percentage of that trade is done with this country, or even with the Empire. A very large proportion is done with countries outside the Empire, especially the United States, Siam and the Dutch East Indies.

In the case of West Africa we have a contrast. There we have a population of a little over twenty millions, and we have again two great staples of production: cocoa, and palm oil and kernel. More than 90 per cent. of the imports come from the United Kingdom; unfortunately, they are not on the same scale, as yet, as in the case of Malaya. The exports, however, are scattered, and there we have a rather significant fact. On the Imperial Shipping Committee we recently had to investigate the facilities for shipping along the West coast of Africa, and the question which constantly arose was "cannot the raw materials be collected for export at a few centres, so that larger and more economical ships can be used?" But we found that the exports are sent in not very unequal proportions to Great Britain, the United States, and Holland, and then in lesser amounts to certain other countries, and the trade is done direct and not in the main to London for re-shipment to other places. We were, therefore, faced with the fact that one of the characteristics of the trade of West Africa is that whereas the imports are mainly from this country, the exports, rapidly growing, are sent direct to various destinations, mainly outside the Empire.

I have now presented four concrete examples of communities within the British Empire, which, from an economic point of view, differ in almost every characteristic. New Zealand is pastoral and trades, both as regards exports and imports, mainly with the mother country. Canada is engaged mainly in agriculture and mining, but has already developed certain manufacturing industries to the point that foreign markets are essential to her for those industries. Malaya has but a small population, and yet a great trade, done mainly with countries outside the British Empire. British West Africa has a much larger population than Malaya, buys almost wholly from the mother country, but sells direct, in no small measure, to several countries outside the Empire. With such facts as these in mind, we shall not attach undue importance to the broad statement which I am now going to make, that the total of imports and exports of the Overseas Empire has now reached a figure which is comparable with the total imports and exports of the mother country; in each case, that is to say, something like £1,800,000,000 sterling. The Overseas Empire has grown up. It is now the equal partner of this country, at any rate for some purposes.

We can make this further statement—which I draw from a memorandum by Sir David Chadwick, which is about to be published by the Imperial Economic Committee—that if you omit what we may describe as the domestic trade of the Empire, or as it is sometimes called, the Inter-Imperial Trade, and if we then add together the imports and exports of all parts of the Empire, we will find that the Empire, as a unity, does a trade with the rest of the world, which is between two and three times as great as the domestic trade between the different parts of the Empire. That is a fact that we have to reckon with, yet we cannot base upon it any broad and simple policy, because as we have seen from the four examples which we have examined, the "global" statements give little or no indication of the circumstances of the parts. This, however, is true, that, except in the case of India, in almost every part of the Empire a relatively large trade, foreign and inter-Imperial, is done in proportion to the population and as compared with foreign countries. Except as regards copper and cotton, the world is very dependent on the countries of the British Empire for raw materials; even Great Britain has her great export of coal.

It is a significant fact that the trade of the Empire with the outer world is greater than the external trade of the United States, and not far short of the external trade of Continental Europe, West of Russia and of the old Austrian Empire. But these three entities (the British Empire, the United States, and Western and Central Continental Europe), as bases of trade, may be regarded as being of the same order of magnitude; in other words, there is no question of the British Empire, however much it co-operated, dominating the rest of the world. But Great Britain without the Empire would be hopelessly overmatched, and still more would any other single part of the Empire be overmatched, in the process of international bargaining to fix quotas of production and to assign markets.

In regard to the magnitude of modern organized buying, manufacturing and selling, I will mention three controlling factors. First there is the effect of the spill-over from such a country as the United States, where exports to foreign markets represent a mere margin of production over and above what is required for internal consumption. A variation in that margin has, as I have already explained, a very destructive effect; one might compare it with the action of iron or steel in a fire. The iron or steel expands, and, when the fire is over, shrinks. As it expands it cracks the walls and the stairs and all the other structures which depend on it, and as it contracts it pulls down what has already been broken. In the same way, the expansion and contraction of the spill-over from a country like the United States, as between good years and bad years, when it comes into competition with

a main line of production in Canada or in this country, is very destructive. Apart from direct competition, moreover, the mere uncertainty beforehand prevents the producer, whether farmer or manufacturer, from knowing the prices on which he may calculate. In order to counter such capricious competition, producers have of late organized for selling; their idea is to seek early information and also to hold up their produce for a time instead of throwing it on to the market blindly. In that way they seek to counter the effect of the shocks that are given to the market by the mere spill-over from countries of vast production and vast home consumption. Russia, no less than the United States, would be such a country, if Russia were in a condition to exercise her power.

The Imperial Economic Committee investigated the action of "orderly marketing," and I am going to quote a paragraph in which, after very great care, we summed up the limits within which it could operate safely. In our report on the marketing of dairy produce we say:—

"To sum up, we recognize that the conditions of the United Kingdom market, where the irregular arrival of supplies leads to fluctuations in price, have justified special steps on the part of Overseas producers to safeguard their interests. Such fluctuations in price have given the opportunity for speculation to buyers and sellers, whose operations have magnified these fluctuations. The remedy is the regularization of supply, and, as we have already pointed out, the stimulation of demand. Organized bodies, with the object of regulating quantity and improving quality, have now come into existence. In Australia and New Zealand they have been given statutory powers. There is a natural fear among traders that bodies enjoying wide statutory powers might be tempted to abuse them. Should they follow the policy of holding up supplies in the United Kingdom for reserved prices, which has been adopted by a certain number of New Zealand factories, they will be venturing upon the very dangerous experiment of mass speculation. If, on the other hand, they limit their activities to the regulation of shipments and the gradual development of orderly marketing in the United Kingdom by such methods as the quotation of prices to give a 'lead' to the market, they will greatly contribute to the stabilization of the market, and will benefit both producers and consumers. We would, therefore, strongly urge upon these Boards the policy of moderation in the use of their powers."

Now for my second controlling factor. I have already referred, incidentally, to the economic unit of industry. Up to a certain point the more we can increase the size of our establishment the more easily will overhead charges be carried, and the lower will be the price that can

be charged for articles and yet leave a profit. Beyond a certain point, either because the thing becomes heterogeneous and unwieldy, or because it becomes so large that the few managing brains cannot deal with it easily, for one reason or another, profits will begin to drop again. There is in each industry at any given time and place an economic or optimum size of factory, and a similar but usually much larger unit for joint buying, selling and research. It is the unit which gives you the maximum return of efficiency as measured in various ways, but normally by profit return.

Such a country as New Zealand is far too small for a factory of the economic unit size in most trades. As regards the unit for joint trading and research, there are probably trades where the whole Empire is not too large a field for the single unit.

Then as to my third controlling factor. Minerals are in the nature of capital. They are where nature has put them, and they are at the disposal of the country that happens to own the territory. They are got out by mining companies. But what really matters is the place where the ore is smelted, because those who smelt the ore must be capitalists on a much greater scale than the mineowner, and they will have the selling of the metal to the world. The economic unit for smelting certain minerals is a large one; that is, partly at any rate, why the United States to-day has so great a control over copper, no matter where mined.

When we look closer each of my controlling factors is seen to be a special case of the economic unit. The first involves the economic unit and the optimum limit of operation of the selling organization for foods and raw materials, other than minerals; the second concerns the optimum units of factory and of buying, selling, and research in manufacturing industry; and the third concerns the optimum unit of smelting.

There is one other matter I must refer to before I sum up my argument. There is a tendency for the depot trade in all parts of the world to diminish, whether it be in London or in Singapore, and for a very natural reason. Take Hong Kong, for instance, in the Far East. There was a time within the memory of old men still living when there were great merchants at Hong Kong. They were months away from the source of their supply in Europe. They had to carry locally very considerable stocks, and that demanded considerable capital. To-day, at Hong Kong, an agent receives an order and sends off a telegram; the goods are stocked in London and the article is sent by the next mail. The ideal of trade to-day would be an endless band, upon which in London we put a matchbox that would arrive at Hong Kong at the exact moment when it is wanted. There is no carrying of large stocks

at the other end; they are carried at this end. But what happens in regard to Hong Kong happens to-day in regard to London itself; goods formerly sent to London for distribution over the world are now tending to be sent direct from the seat of production. The limit to this tendency lies in the optimum size of ships; there must be a certain size of ship to run economically; again we come to the economic unit.

So we come back to the fact that the Empire is now doing a trade with the outer world three times as great as the trade between the different parts of the Empire. The goods are going direct.

The limits to this process are to be found in the combined influence of all the optimum sizes of ships, selling and buying organizations, smelting plants, factories, research organizations, distributing organizations, and so forth. How vast can the unit for some purposes become? Take tyre manufacturing. There we have one great company in this country, another in France, and four or five in the United States—all six or seven of the same order of size. These companies together do nine-tenths of the tyre manufacturing of the world. Each of them has branches in the territories of the others, and the result is that they bargain with one another for the world markets. If we are to do a bargain, we must be on something like the same scale as the man we are bargaining with, otherwise it ceases to be a bargain and becomes a dictation from one side to the other. It may be that certain great industries within the Empire could, if federated, do bargains with equivalent industries in other countries with something like an equality of power, although the industry in any one part of the Empire might not be adequate.

So I lead up to the idea that, while we usually think of trade within the Empire, trade between the different parts of the Empire, and the remainder of the world is growing apace, and the time is coming—if not come—when we shall have to think just as much of the deals of the Empire as a whole with foreign countries as of the deals of one portion of the Empire with another portion. As I said just now, if we compare this Empire with a potential United States of Europe and with the actual United States of America, and with other great agglomerations, which are not, perhaps, immediately upon us, but are yet looming on the horizon, it is not merely fanciful or imaginative to speak of the Empire as one of the units in a bargaining world.

Let me give an example where bargaining by the Empire as a whole has already become possible. We have lately gathered into one great concern, by the agreement of the different Governments, the whole, or practically the whole, of the cable and wireless system of the Empire. So there now exists an organization which can bargain to-day on equal

terms with an organization of similar scale in the United States. The one organization does nearly the whole telegraphic business between the parts of the British Empire, and the other does the greater part of the internal telegraphic business of the United States. As a matter of fact, there are two companies in the United States, but one is so much greater than the other that we may think of that alone as being the equivalent of our Imperial system. It may be that the British and American directorates can get together and bargain, each for a fair share of the communications between the Empire and the Republic. In that instance, with the help of Government control, we are already in a position where the Empire is ready as a unit to bargain on level terms with other vast units in the world.

In order to attain to the great economic units of modern industry, it may well be that we ought to assign certain manufacturing to certain parts of the Empire and certain other manufacturing to other parts. We should, in other words, do deals as between ourselves, with a view to Imperial rationalization. It would be a sensible thing to do, but difficult under the conditions of democracy. Do not let us minimise that difficulty; if a Government were to say "We have done a deal with our partners in the Empire by which we are especially to foster such and such lines of manufacturing, and they are to foster others," then the citizen under that Government who happens to be committed to seeking his fortune in one of the unfavoured trades would say to his Member of Parliament, "Why am I to be side-tracked? Why is my friend here to be favoured by our country? Do I not also pay taxes?" Quite evidently, therefore, any such rationalization must be a matter of careful and slow fostering and growth; it cannot possibly be accomplished suddenly.

I come, thus, to my conclusion, that all these generalised policies, which may be useful from the point of view of education, are of very little use in practice. They are good, perhaps, as indicating the direction that you wish to take, and so for purposes of propaganda, and to enable the peoples to sanction broad lines of policy. But the British Empire is a great business partnership—fortunately a family partnership—and just as, in an ordinary business concern, you build each day on what was accomplished yesterday, so must it be in regard to the Empire. You take the next step in view of the position to-day, but by that next step you create a new position, and the step after next must be taken in view of that new position, and not in view of the position to-day, and so on endlessly. Let us agree that we wish to keep together in the family partnership, and to hold with us those whom we have taken into partnership from outside; even so, we shall be none too strong for the bargaining world which is now around us; and then let us carry

out our aim by ordinary business methods, limited by no academic ideals, no democratic cries, but acting each day in the new position that was created by the success or the failure of the action of yesterday.

I believe, therefore, that the most important thing for us at the present time, if we can once agree as to our general aim, is to create the necessary machinery for Imperial economic co-operation. In this country nearly all our great advances have taken the form of constitutional machinery. We taught the world how to use a monarchy and what a Parliament could be. We taught what the law courts could be, making the common law; we taught what a cabinet should be, and now we have an opportunity of teaching the world what should be the institutions of co-operation between nations. It would be in harmony with our whole tradition if we did that; but in the meantime I have no doubt there will be acres of paper covered with print in defence of propagandist generalizations!

DISCUSSION.

SIR DAVID WILSON-BARKER: Sir Halford Mackinder is very well known, both at the Geographical Society and elsewhere. We can regard him as a final authority in many important subjects. Still, I noticed the lecturer made no allusion to the part the Mercantile Marine plays in the distribution of our goods in the Empire. I think it is rather important that this should be taken into account.

I think many of the lecturer's observations are somewhat theoretical, and I very much doubt whether the Dominions and Colonies would accept some of his conclusions. At the same time, he rightly points out that trade has a most important bearing upon the welfare of the Empire, and that a vital matter which is causing us serious consideration at the present time is how long will the Empire be able to hold together economically on the conditions which some people are proposing now.

SIR HALFORD MACKINDER, in reply, said: I am not going to discuss Sir David Wilson-Barker's description of my arguments as theoretical, but I would remind him that, according to yesterday's papers, the London, Midland and Scottish Railway have just appointed a Vice-President to conduct research. We have entered an age in which you have to think not only in continents and in hundreds of millions, but also in tendencies. Just as in the Great War, Commanders-in-Chief no longer thought and guided with the old precision, but directed the movement of "masses," so it has come to be in commerce. I am not going to discuss the question of whether that is theoretical or not; I am myself convinced that the kind of position that I have been putting, is the position which business men on a great scale are assuming. You have only to read the journals issued to their staffs by the five great banks in this country to see the kind of consideration which now occupies the supreme boards of the vast concerns, whose capital runs to fifty or a hundred millions or more. You cannot manage massed business in the same so-called "practical" way as was formerly employed. My trouble is that in the political world under democratic conditions we are too limited in outlook; the great captains of commerce have a wider horizon. That is why to an increasing extent University men are being employed by the larger commercial and financial houses.

Sir David would have liked me to have said more about the Mercantile Marine; I did not do so, partly because you cannot cover the world in an hour, but also because I am Chairman of the Imperial Shipping Committee, and am more tied in what I say about mercantile shipping than I am in regard to general economic matters, for the reason that the Imperial Shipping Committee may be described as quasi-judicial; we have to consider complaints as well as review general economic positions.

I will just say this. The thing which is always present to my mind is the smallness of the capital which is embarked in the Mercantile Marine, when you consider the great place that it occupies—and rightly occupies—in the imagination of the world. If you take the total tonnage owned by this country, about twenty million tons gross, and, taking one ship with another, value it at, say, £10 a ton—I care not if you take a replacement value of £20—then at £10 a ton you get a value of £200,000,000, which is not equal to the capital of the L.M.S. or the L.N.E. Railway.

We hold our place on the ocean with our merchant shipping owing to quite other considerations than money-power—such considerations as Sir David Wilson-Barker of all people must have experience of and know. If our managers of shipping had had to live through a war like the Napoleonic war, of twenty years instead of four years, most of them would have died, and after the war younger people without experience would have had to take control. We have saved the merchant shipping of this country mainly because the experienced brains, both the management and the captains, were not destroyed during the war. It is brain and experience, in a large measure, that maintain our position on the ocean.

You cannot, however, neglect the general economic position of the Empire when considering the Mercantile Marine. Professor Trevelyan, in the remarkable History of England he published a year or two ago, drew pointed attention to the fact that we have retained the carrying power on the ocean for so long, as compared with the short periods of the Venetians, Dutch and Portuguese, largely because we were not merely carriers, but had something to sell. When a boy I travelled in a ship, the master of which was still a merchant on behalf of his owners, as the old-fashioned shipmaster always was; he was a buyer and seller at the foreign ports touched. Before the days of the telegraph, a captain was away for months and possibly years, and when he came back he rendered his accounts and paid over the profit. Hakluyt suggested we should send our ships to Japan, because it had a northern climate, and they might be willing to buy our woollen goods. It was because we had first wool, then woollen goods, and finally coal to carry and sell that we got the great position in the mercantile marine industry that we obtained. To-day I am convinced that in the long run we cannot hold our position in shipping, apart from the productive strength of this country and of the Empire.

The customary votes of thanks to the Lecturer and to the Chairman were carried by acclamation.

THE PRINCIPLES OF WAR

By Lieutenant-Colonel H. de Watteville.

I. THE QUEST FOR REALITY.

SINCE the Great War various books, official manuals and articles, all attempting to codify or to explain the accepted Principles of War, have appeared. It is by no means evident, however, that these attempts have satisfied all branches or all ranks of the fighting Services. Recent articles published in this Journal will alone demonstrate the fact that there still prevails a considerable cleavage of opinion under this head in quarters where one might have expected to discover a greater degree of harmony.

To some extent this will always be so, since there generally exists this kind of division of thought in the fighting Services: on the one hand we have the historian, the student of war in the abstract, the higher leaders and staffs in war itself; on the other hand we find the hard-headed man of action, the leaders of forces in actual battle. The antithesis between the two groups is sure to persist. But, as things are and must be, it is normally the former group to whose lot it falls to enunciate the Principles of War, which all fighting leaders are destined to assimilate in peace and to observe in war. The problem is not new. Long before the Great War, many soldiers, particularly among those who dealt with the training of the Territorial Army, were dissatisfied with the seemingly nebulous or academic provisions of our Service manuals. The same held good of the Dominion Forces. The late Major-General W. T. Bridges, who at Gallipoli in 1915 was killed at the head of the 1st Australian Division, at a General Staff Conference some few years earlier had voiced this feeling in the words that "the periods of our Field Service Regulations were of no more value to overseas troops than a cuneiform inscription on a Babylonian brick." Even in 1915, after the Battle of Loos, a report dealing with the training of the new troops engaged in that fighting reveals an almost identical criticism.[1]

[1] See "Military Operations: France and Belgium, 1915," Vol. II, page viii.

Since the war, a great deal of thought has been expended in recasting our doctrine of war, and the new edition of Field Service Regulations contains the outcome of the labours of those entrusted with that task. Their reasoning appears sound enough, and the formulation of the Principles of War now put forward may well seem full and adequate. But, for all that, we are still left in doubt as to whether these somewhat general pronouncements do meet the needs of the situation. In the sister Service there also appears to be some questioning of accepted tenets, and Rear-Admiral Usborne, in his recent Dialogues,[1] is evidently voicing a school which is seeking more definite guidance in the conduct of war than that to be found in existing text books. We have only to look a little further afield to see the stream of literature that is already coming out " in explanation," or " in expansion," of our new Service manuals.

To these contentions the answer of those whose duty it is to produce these manuals is probably the same as it always has been, namely, that any more detailed or cut-and-dried definitions of the Principles of War must tend to a rigid formalism that would be inimical to success in war ; elasticity of doctrine and training must be preserved at all costs, more especially because the British Army has to be prepared to meet varying conditions all the world over. With very much of this one may be quite ready to agree. Still, we are left wondering whether some compromise is not possible ; whether the doctrine enshrined in our manuals might not be expounded in more simple and direct language for the fighting ranks, as distinct from the Higher Commands and Staffs ; whether it would not be possible to strike a mean between the enunciation of abstract ideas on the one hand and the somewhat treacherous *memoria technica* of the crammer on the other. That there is need for some solution of this type admits of little doubt. Mistrust of the " abstract idea " is growing in many quarters. Ours is a mechanical generation ; it is a generation which looks for practical guidance ; one which reasons, argues, seeks to fathom cause and effect ; it is not satisfied with generalities alone, nor with the *obiter dicta* of higher authority, nor with purely theoretical deductions.

Let us, therefore, examine first what the actual scope of these so-called Principles of War may be ; then, secondly, how they should best be applied. It is not proposed to attempt to evolve yet another catalogue of the Principles themselves, nor to reword them to our liking. For these two tasks seem to be capable of a varying interpretation, according to the mentality of the individual, which seems to preclude their ever approaching finality.

[1] See R.U.S.I. JOURNAL, August, 1929, and February, 1930.

II. THE SCOPE OF THE PRINCIPLES OF WAR.

In the first place, war, since it deals with the re-actions of the human mind, and still more with the re-actions of the "collective" and not the " individual " mind, must be regarded as an art and not as a science. It is, therefore, impossible to formulate any rigid " laws" applicable to the conflict of nations in arms in the same fashion as it is possible to determine any fixed laws, or principles, in the sphere of physics or optics. Many writers have attempted to derive such laws from a study of naval or military history, but they have one and all failed to find any set of definite rules that will really stand the test of practical or universal application. Others, like Jomini and his translators and imitators, have concentrated their attention on the purely logistical side of war, i.e., considerations of time and space in naval or military strategy. Having omitted to make adequate allowance for the human side of warfare, that is, the variable factor introduced into war by man himself, their conclusions often tend to lead us astray. Neither will the greater mechanical and scientific bias now being imparted to all potential warlike activities conduce to an exact determination of the Principles of War. Still less can we base our whole theory of war on the technical value of armament, or on its role in attaining victory in modern battle; for if we consider the many errors that may creep into combatant operations through the failure of the machine—be it in the air, on the sea or on land—through causes ranging from personal miscalculation up to climatic catastrophe, we must realize how far we stand from the discovery of any exact rules for the attainment of success in war. Further, the recent introduction of economic, social and psychological factors into war seems to render exact laws of war more impossible to discover than ever in times past. So the real artists in war of the future, just as the "great captains" of the past, may seemingly disregard any rules that have ever been formulated, whenever their intuition so decides. Genius will never be trammelled by the limits which have to be respected by others less gifted. The Principles of War, however, must always serve for the education of all combatants and for the guidance of those in whom that natural or acquired warlike intuition has not been developed.

Secondly, in dealing with the Principles of War, we have to bear in mind that they have nearly always been formulated from the intellectual or professional plane of the writer or thinker himself. Moreover, in the past, war having been regarded as the business of the soldier, it has been left to him to lay down rules for its conduct, which the civilian mind of the statesman has been left to apply. This procedure is fraught with dangers, which are growing greater the further we recede from the days of the soldier-rulers, such as Frederick and Napoleon. Yet it is

still contended that these Principles should be applicable to the entire range of the activities of a nation engaged in war, "from a Cabinet Minister down to a Private of Marines," as Admiral Usborne puts it. This desire to evolve a code of rules capable of universal application is perfectly natural. But if we follow it out in practice, it will inevitably be found to lead to setting up once more as our final code of Principles all those self-same abstract ideas against which the man of action instinctively rebels.

Accordingly, if we attempt to apply our accepted "Principles of War," as we find them expressed in some Service publications, to the whole range of war activities, are we not rather—to use the homely simile—"putting the cart before the horse"? To argue that the War Policy of the statesman must observe the same principles as those governing the employment of armed force by the soldier may be, to a great extent, perfectly sound; but there are other and broader considerations that War Policy has to take into account, for which pure strategy may have little concern. War Policy needs to come first in our calculations.[1] To take a remarkable instance, discussed by General Maurice in his new book[2]: Clausewitz in his Principles includes that of "gaining public opinion," which is a "Principle" that must play a distinct part in moulding the War Policy of a belligerent nation, not only with regard to its own nationals, but also in respect to neutrals, and lastly, with reference to its effect on the enemy; but in the application of this "Principle" the Commander-in-Chief can only carry out a policy that is placed before him.

How far, then, can our Principles of War be made to cover the whole range of war activities, from "a Cabinet Minister to a Private of Marines"? If we admit that our Principles should be applicable by a Cabinet Minister, then they needs must be couched in the broadest terms, terms indeed so broad that they would be of little utility to a Private of Marines in the face of the enemy. The very language of the Principles guiding the action of these individuals must vary according to the mentality of those who have to apply them. So it is that the code of Principles to be found in the present Field Service Regulations is couched in the language current among the General Staff of the Headquarters of the Army. But, in the case of an Army such as ours, which may be expanded in time of need, or may include those non-regular elements that may be drawn from the frontiers of the Empire, we may well ask if this is enough.

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[1] The position in modern war was examined in a previous article, to which reference is invited.

[2] "British Strategy," Chapter III.

Consequently, we should be content to leave the broad " Principles of War " as abstract ideas, if those Principles are to be applied by trained intellects in high places. The man of genius will continue to observe any or all of these Principles, just as the inspiration of the moment may dictate. It may even be found unnecessary to formulate any rules at all for the conduct of war by the highest authorities of a nation: if not unnecessary it may be impracticable. In any case, we must be satisfied that our Principles can be made applicable to war in its widest aspects; that they will embrace the activities of the statesman as well as of the combatant; that they can also govern the employment of the instruments of war other than armed force. Again, we must be able to deduce from these Principles of War a more restricted doctrine for the employment of armed forces, which shall be common to all three fighting Services and equally understood by them all. In turn, these Principles should be expounded in a broad manner for each Service, just as is now done in the case of the Field Service Regulations for the Army. Then these same Principles must be further brought down to the level of the subordinate commanders and their men.

We are tempted to conclude that the Principles of War can be considered as properly enunciated only when they satisfy the various grades of intellects that a nation in arms may comprise. Further, that, if we evolve one set of general Principles that satisfy all requirements, those Principles must be capable of such further definition and explanation as may lead to their being understood by all who may have to apply them, both in the abstract or in the concrete spheres of war.

Moreover, we must not define our Principles too rigidly, the more they are to be applicable to the whole range of war activities of the future. To speak of the Principles of War as immutable may be misleading. These Principles, if appropriate to an actual contest between two individuals, two combatants or two bodies of troops, may never vary at all through the ages. But when we rise higher in the scale there may arise variations in the value of the Principles, due to the effects of time, of political conditions, or of armament, which might cause some difference to be felt as to their relative importance: so much so that we see seemingly valid Principles, as enunciated by Clausewitz, overlooked or discarded by writers of a century later.

Lastly, we must recognise the fact that the nearer we approach the shock of actual battle, the less room there is for the reasoned application of any rules or " Principles " of any sort or kind. In these circumstances the work of the Principles has been accomplished before-

hand; it is left for intuition, natural or acquired, to act correctly in such emergencies.[1]

III. THE APPLICATION OF THE PRINCIPLES OF WAR.

If we accept the statement of the relations that should subsist between War Policy, Grand Strategy and Strategy, as outlined in a previous paper[2], it is possible to systematize to a considerable extent our views concerning the application of the Principles of War. The Principles of War are concerned with the conduct of a campaign as a whole: the fighting Services need only apply them as far as the employment of armed force is involved. This view has already been put forward by many writers. We can, therefore, clear the ground of any familiar expressions, such as "Policy and Strategy must go hand-in-hand." The relations of War Policy and Strategy must automatically fall into their proper place and perspective.

We are next faced with a consideration of the relations that should exist between the "Object" of the war and the "Principles" which should govern its conduct. If we regard the Principles of War from the wider aspect, we shall at once comprehend the place that the "Object" must occupy with regard to these Principles. The "Object" is not a Principle in itself; but the necessity for defining and maintaining the Object may well be regarded as an all-important Principle.

From the standpoint of War Policy the "Object" of any war is the crux of the whole matter; the whole *raison d'être* of a war in prospect may turn upon the selection of this "Object." When we come down to Grand Strategy the matter becomes more simple, although even then it must offer many complex issues. We have only to name the problem of the Dardanelles as it presented itself to the authorities responsible for our Grand Strategy in 1914–15. Following this train of thought

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[1] In his book Sir Frederick Maurice says:—It is, however, true to say, since we find that there are certain methods common to all great commanders, from Hannibal to Foch, that there is an established and permanent basis of experience from which certain general principles of war, applicable at any given time, can be deduced. The inclusion or exclusion of principles from any particular list depends, as we have seen, partly on whether we are considering war in general, or whether we are concerned only with its military aspect. It depends also upon the conditions of the time, since these affect the relative importance of principles and change their values. The principles of war are not, therefore, to be regarded as the items of a recipe which, if properly compounded, will produce victory, but as guides to train our minds to deal with the problems of war in the right way." "British Strategy," p. 47.

[2] "The Conduct of Modern War." R.U.S.I. JOURNAL, February, 1930, p. 70.

we can see why, if we consider the " Object " from this standpoint, any minor campaign, any demonstration, any feint, can have a strictly limited " Object." Was it not a complete misunderstanding as to the limitations of the objectives primarily selected in Mesopotamia during the Great War which became responsible for the increasing entanglements of the original expedition ? The question, however, of " limited " or "unlimited" objectives does not affect the Principles of War nor their application in war.

Again, if we consider the " Object " as being the chief concern of the statesman's War Policy, and of the Grand Strategy based thereon, we will realize how far it is possible to over-emphasize " the destruction of the enemy's forces " as the sole end of war. Our Field Service Regulations state that the true end of war is the subjugation of the enemy's will. If so, then the destruction of the enemy's forces need not *necessarily* be regarded as the only complete end of our War Policy. That desirable occurrence may well form the Commander-in-Chief's main objective ; it may be conducive beyond all else to a successful termination of a campaign. On the other hand, the neutralization or paralysis of an enemy's armed forces may suffice to achieve the purpose of our War Policy. We would once more refer to the action of the Royal Navy in the late war. These facts, again, do not affect the Principles of War.

We can, therefore, fully endorse the view, embodied in our Field Service Regulations, that the " Object " forms no part of the Principles of War. On the other hand, the importance of the " Object " and its true appreciation is so far reaching, that we cannot rest content with a mere definition, or state that the " Object " in war is " the subjugation of the enemy's will," or " the destruction of his armed forces," or some other aim, whether vaguely abstract or ideally concrete. The truly sound doctrine, which we find in Field Service Regulations, reads : " In the conduct of war as a whole, and in every operation of war, it is essential to decide upon and clearly to define the object which the use of force is intended to attain ; in other words, at each and every stage of the conduct of the war there must be a clearly defined objective." The Regulations might well press the point home further by adding : " it is no less important that the object should be specified in detail and in degree corresponding to the individuals charged with its attainment, and interpreted in such a way as to ensure that it is clearly understood and will be remembered," or some similar injunction.

To put the matter in popular tabular form :—

(1) The " Object " of our War Policy may be :—

" The subjugation of the enemy's will."

(2) The object of our Grand Strategy may be to :—
  (*a*) " stop all seaborne supplies " ;
  (*b*) " drive the enemy out of territory occupied by him "
  (*c*) " demoralize centres of national effort by air attack " ;
  (*d*) " demoralize the enemy nation by economic attack and propaganda " ;
  or any combination of the above or like aims.

(3) The " Object " of the Strategy of a Commander-in-Chief (the task assigned to him), may be to :—
  " defeat the enemy forces opposed to him."

(4) The " Object " of Minor Tactics, i.e., of our subordinate leaders, may be to :—
  " sink an opposing ship " ; " destroy an enemy detachment " ; or " shoot down an enemy squadron."

Whatever form may be given to this view of the case, it is necessary that every combatant unit or individual should be given a definite aim to pursue. This, after all, is the method employed both in writing an appreciation or a set of orders before action. Why not make this still clearer in every one of our Service Manuals ?

Once the " Object " has been fixed in some such manner as that outlined above, it becomes clear that our accepted Principles of War are little more than the methods which should normally be followed in order to attain that "Object." Consequently, the observance of these Principles, as Field Service Regulations point out, is essential for the attainment of the object, provided they are not defined in too arbitrary or too final a manner. The Principles of War have been applied, if not instinctively almost unconsciously, by successful leaders in the past. It is very doubtful whether any of the " great captains " deliberately considered " concentration," " economy of force," " surprise," etc., in making their plans of operations. The value of the Principles is really very largely " educational." It would seem, therefore, that while the learner should be fully alive to the importance of such Principles, he should not come to regard them as " immutable," much less should he derive the impression that wars can be conducted on pedantic lines. For these reasons, we suggest that in studying history with a view to acquiring power of command, " example " is so much more important than " precept."

It seems not improbable that our ideas concerning the value and true meaning of the Principles of War run some risk of becoming warped through our methods of employing military history as a vehicle for the acquisition of professional knowledge. To gain a general insight into what war means, the study of various campaigns is certainly essential. Again, with a view to training the mind for the appreciation

of strategic problems, military history and its reasoned study, as at present practised, appears to be the broad avenue to any proficiency. But for the sharpening of tactical intuition we may question whether our present system is adequate. A campaign as a whole—at any rate as now studied—seems too vast a theme to admit of its dissection for the study of tactical incidents. At any rate, in the case of junior officers, we may ask whether it would not be advisable to insist on the study of some specially selected regimental history or two, supplemented by the perusal of some personal narratives of participants in actual war. The Great War is sufficiently modern to admit of the adoption of some such educational method. The whole subject passes outside our present limits. We only wish to suggest that it seems of doubtful advantage to attempt to confuse the wider Principles of War that hold good in large strategic problems, and savour therefore of the abstract, with the more narrow interpretation which must remain strictly concrete and therefore entirely utilitarian. Is there not a possibility of confusing the "Principles of War" with correct, and mark winning, answers to an examination paper?

This brings us once more to the opinion that in interpreting the "Principles of War," it is essential to use language and illustrations suitable to the grade of personnel we are seeking to influence. The abstract and the academic may appeal to a certain type of mind which will not, or cannot, concern itself with the definite and the detailed; but the Services essentially cater for men of action, who are wont to ask for more direct guidance and more practical expositions of their problems than are often to be found in text books.

It is not our present purpose to review each and every one of the accepted Principles of War, nor to criticise and seek to find substitutes for them or for the text book definitions. But it is our desire to express what we believe is a growing feeling amongst the present generation in the Services, that the written word of the Principles of War should *inspire* and not govern leadership; that from time to time these Principles should be closely scrutinized in the light, not only of past, but also of present day conditions, and that they should be expounded in a form which makes them seem practical and personal, as well as logical. Otherwise they will not carry the necessary weight; they must then fail in their true purpose.

SURPRISE IN NAVAL WARFARE

(*A summary of the German Naval Prize Essay for* 1929, *by* CAPTAIN OSWALD PAUL, *late Imperial German Navy, which appeared in the "Marine Rundschau," November and December,* 1929).

GENERAL CONSIDERATIONS.

BY surprise in sea warfare we mean any sudden or unexpected event which catches a navy at war unprepared, and so influences its military position and projects. The causes are myriad: storms, sudden changes of weather or visibility, the unexpected action of unseen weapons, such as submarines or mines, the first employment of weapons hitherto unknown, and finally the tactics of the combatants themselves. Man cannot control changes of weather, and can barely foretell them. They are the ordinary risks of sea warfare and can hardly be classed with military surprises, yet chance may exercise considerable effect on the successful use of underwater weapons. Then, again, it may require special skill to bring these weapons to their target in bad weather.

New weapons rank among the deliberate surprises, since they are designed to place an opponent in situations from which he has neither the ability nor the force to extricate himself. Such, also, are raids, surprise attacks, feints and ruses.

The object of every surprise is to establish superiority at a particular moment, not only by number of ships, but by methods of attack and defence, speed, manœuvre, battle training, and, not least, the tactical ability of the leader in war. The essential aim is to compel the opponent to take a certain course. Almost always it is the attacker who will surprise, hardly ever the man who fights on the defensive; but it is in surprise that the weaker man finds his opportunity to meet his stronger opponent with hope of success.

The essence of surprise is secrecy; the intended attack must be known only to a few; it must be carried out expeditiously; the responsibility for its execution must, if possible, rest on a single man's shoulders. Thus surprise undertakings are more easily carried out by an insular nation than a continental Power whose long frontiers and

uncertain neighbours assist spies. Incomplete secrecy may turn the would-be surpriser into the surprised with overwhelming result.

Clausewitz teaches that the idea of surprise is fascinating, but that when attempted it is often held up by the friction of the machine. On land, surprise is more feasible in tactics than in strategy, but the smaller the field in which it is used the smaller will be the result. Important or decisive results due to surprise in land warfare are rarely found in history down to 1914. A single victory seldom ends a land war, but has often finished a war on sea. It takes time to repair a fleet. The Japanese found each victory from the Yalu onwards harder to achieve, while Togo's success at Tsushima settled the war. Any sea battle may be decisive, and tactical surprise is not too difficult to achieve at sea. Yet it has sometimes sealed the fate of nations; therefore, it must be urgently sought.

Surprise as a Diplomatic Weapon.

A fleet can be mobilized with the minimum of publicity and loss of time; it can proceed to any destination without anyone but its leader knowing what its sailing orders are. With its speed, mobility, and concentration of power, a fleet is an ideal instrument for influencing opinion during times of international tension; by its sudden appearance it can convey a threat of war, while it may be the means of securing the acceptance of political demands. A "naval demonstration" is a clear indication that a Power has force at its disposal.

In 1801, England sent a fleet of eighteen ships of the line into the Sound with an ambassador to present her demands to Denmark. This demonstration was intended as a surprise, but, owing to lack of enterprise on the part of Sir Hyde Parker, days were wasted at Elsinore before the fleet appeared off Copenhagen, with the result that the Danes showed resistance and fighting ensued. Had it not been for Nelson's energetic assumption of responsibility, the expedition must have been a complete failure.

Strategical Surprises.

The advantages to be gained from a surprise are greatest during the days of tension and preparation before the outbreak of hostilities. It is rare that both sides are equally ready to seek a decision by arms, nor are they likely to be equally well prepared for war. The stronger of the two will naturally take the offensive with the least delay, before an opponent has time to make good any deficiencies in armament or personnel. Two examples will serve to show what far-reaching results can be attained by surprise, once hostilities have become inevitable.

Philip II began to mobilize the Armada in 1587. The English fleet had been much neglected, and time was needed to convert it into an effective fighting unit. There was nothing for it but to attack the Spaniards before they could put to sea. This enterprise was entrusted to Sir Francis Drake: one of the bravest and most determined of sea heroes, and right well he performed it. He suddenly appeared at Cadiz with six men-of-war and seventeen armed merchant ships, and after a sharp engagement with a large part of the Armada which was concentrated there, he severely damaged a number of the Spanish ships, and then withdrew in safety. This desperate measure gained a much-needed year of respite for the English.

Again, in 1904, the Japanese launched an attack against the Russian fleet two days before the formal declaration of war. Although they did no great damage, it was sufficient to secure for them the command of the sea for three months.

With the passing of centuries opportunities for such spectacular surprises have become rare. A definite technique of war has developed with the changing conditions, which has evolved certain principles of action common to all States. But strategic surprises of this nature cannot be governed by any set rules; it is a factor in war which stands on a plane by itself, and it may rise above all the more ordinary operations of war.

Tactical Surprises.

The man-of-war is the primary weapon of naval warfare, and the sea its battlefield. The peculiar characteristics of this field of action necessitate tactics entirely different from those suited to war on land. At sea no flank marches nor rear attacks are to be feared; movement is not limited to defined routes; there are no impassable obstacles, except shallow water, and nothing to interrupt range of vision but darkness or fog. Very little can be done in the way of masking naval operations, and an enemy's approach and deployment may be under constant observation. Unlike his military colleague, the naval commander has to make momentous decisions in the midst of the distracting thunder of the fight, while exposed to the same danger as his men; the qualities he displays as a leader are more conspicuous than they would be on land, and the sense of responsibility and power of independent judgment in subordinates is more highly developed. One naturally connects the most notable examples of tactical surprise with the names of the leaders who achieved them: Howard, de Ruyter, Hood, Collingwood, Nelson, Tegetthoff.

As late as the battle of Lepanto, naval actions were fought in clumsy, man-propelled ships. Deployment on a broad, generally sickle-shaped,

front was slow. Each individual ship chose her opponent, and flagship engaged flagship. The main object was to ram and sink the enemy craft, and boarding was only resorted to when everything else had failed. There was very little scope for employing surprise tactics with such slow-moving ships. In the Punic Wars, the Romans overpowered the Carthaginians by using boarding gangways, a new invention which the Carthaginians were unable to counter effectively. In the great wars of the VIIth and VIIIth centuries, between the Turks and the Eastern Empire, the former were defeated by a new weapon: Greek Fire, which was a mixture of sulphur, nitre, pitch and petroleum, packed in earthen pots, then lighted and thrown on board the hostile wooden ships. First used in 677 and again in 718 A.D., it burned the Turkish ships and delayed the fall of Constantinople for seven hundred years.

The advent of the sailing ship increased the opportunities for tactical surprise, for even the square-rigged sailing ship could get within six points of the wind, although she had a blind sector into which she could not advance with rapidity, while the van could not easily help the rear. De Ruyter took advantage of this factor in the famous "Four Days' Battle," as also did Nelson at the Nile and Trafalgar. At the Nile the French had a second surprise when the English pushed in between them and the shore: an attack so little expected that the French guns on that side were encumbered with ship's gear from the other side, with the result that only two ships out of thirteen escaped with Villeneuve.

The introduction of steam and the transition from wooden to iron ships came at the time of the American Civil War, and this period also saw the development of many technical inventions and improvements, such as the armoured swivel turret of the famous "Monitor," heavy artillery, electric mines, and even an attempt at a submarine. One of the best-known examples of tactical surprise at this time was Tegethoff's exploit at Lissa. "Ram the enemy and sink him" was his signal to the smaller Austrian fleet, which found the Italians unprepared for this manœuvre. The operation—as dangerous to the rammer as the rammed—resulted in a brilliant victory against heavy odds.

Similar results followed the clever Japanese dash through the protected harbour of Wei-Hai-wei in 1894, and the destruction of a battleship and cruiser.

In later years, when improvements in shipbuilding and the use of the most recent weapons, including long-range guns, on the one hand, and the introduction of better armour, on the other, became general, opportunities for surprise grew less. In place of actual surprise it grew to be the practice to seek victory by the establishment of a fire superiority, obtained by means of a preconceived tactical procedure.

Surprise in the World War.

When considering surprise at sea in the World War, we must begin by noting that Germany never failed to produce men with the enterprise and courage necessary to exploit this factor successfully in tactics. Such examples may be quoted as the torpedoing of a Japanese cruiser and of the "Goliath" at night, the work of our small cruisers in foreign waters, the destruction of two munition ships in East Africa, and the exploits of our submarines, auxiliary cruisers, naval airships and seaplanes.

Considering the duration of the World War, there were comparatively few operations which depended for their success on surprise, and the most notable exploits of this kind were achieved by the British. The German fleet was the weaker, and should, therefore, have made every possible use of surprise to improve its strategical position. Surprise and the employment of stratagem come more naturally to the British than to the Germans; the Anglo-Saxon is a master of improvization, and has more acute powers of judgment. Many British triumphs at sea may be traced to their successful use of this factor in tactics. As the cunning Greeks invented the Trojan Horse, so the British devised "dummy warships" as a bait for the German fleet, and though this huge bluff failed in its purpose, it serves as a characteristic example of British methods. From the English also came the mystery ships, U-boat traps and panic parties, designed to entice the enemy to his doom. They were also the first to use camouflage.

The German Navy was a comparatively new creation, and had few traditions behind it. War games did not encourage original ideas, and no reference was made to surprise in war instructions, except in the case of torpedo boats.

When war broke out the English fleet was all but fully mobilized, and was the first to take action, yet it did not take advantage of this favourable opening. Throughout the war the British motto was "Hold together and avoid losses." Nor did the Germans open the war by making any attack on the British bases, though subsequent events seem to show that they might have been successful. We contented ourselves with sending the pleasure steamer, "Königin Louise," converted into a mine-layer, into the Thames estuary, where it laid a minefield under the noses of the British destroyers, which sank her, though they did not find her mines, and these sank the "Amphion."

While nothing much was happening in the North Sea, great events with most important results were taking place in the Mediterranean, where the "Goeben" and "Breslau" were at large. These cruisers finally reached Constantinople, and brought Turkey into the war.

On the 28th August, 1914, after three weeks of apparent inaction, which was used by the British to get infomation of our activities in the Heligoland Bight, an attack was launched against our line of defence by powerful British forces. Such action on the part of the enemy was to be expected, yet we were not prepared for it. It cannot be denied that we were taken by surprise, and owing to bad visibility and carelessness, we lost several small cruisers, so that the action may be regarded as a British success, due to their employment of the factor of surprise.

The British policy of an extensive blockade and of retaining the fleet in the northern harbours compelled the German High Command to try to lure them out. It was anticipated that attacks on the English coast and bombardment of fortified places would tempt the British to reprisals, and to seek an engagement with the High Sea Fleet. Surprise attacks on the English coast were, therefore, undertaken, and though these were on the whole successful, they did not fulfil their purpose of drawing the British fleet into the Bight. It is open to argument whether these actions can be regarded as surprises. A part of the British fleet was at sea, with the object of meeting the Germans, whom they knew were about, and such action later gave them the opportunity of engaging our fleet at Jutland. The failure of our fleet on 24th January, 1915, to support its cruisers led to the Dogger Bank. Having trusted too much to our plans being kept secret, we were taken by surprise on that occasion.

As far as possible, dark nights were chosen for destroyer attacks, for occasional attacks from the air on patrols, or on neutral convoys under enemy protection, and on the guards of the Channel net, and excellent results were achieved, sometimes even in bright daylight. This taught us that the most unlikely and seemingly impossible attempts were often the most successful, when carried out with the necessary ability.

At first, England was unprepared for attacks from the air, but her anti-aircraft protection improved, and by the summer of 1918 the aeroplane was so far master of the airship, that all these kinds of raid were given up. The utility of the airship for raiding warfare was definitely at an end.

JUTLAND.

As regards Jutland (Skagerrak), it may be asked, did this battle develop out of an attempt at surprise by one combatant; and to what extent did tactical surprises influence the outcome? As a matter of fact, each side hoped to cut off a part of the other's fleet and overwhelm it. The German official account speaks bluntly of a trap set for the

German fleet. The latter, on this occasion, succeeded in getting to sea unbeknown to the enemy; for, even if it were not concealed from the enemy that a great German enterprise was under way, the presence of the combined German fleet remained unknown to the British command until it was actually sighted and reported by the "Southampton." The object of our fleet leaders for the previous two years: to bring our battleships into action against a part only of the hostile fleet, was accomplished. The surprise turned out well, but the tactical result of the entry of our battle fleet, apart from the useful relief of our battle cruisers, was less than had been hoped.

In the light of past experience, the German fleet, having now recognized the 1st Battle Cruiser and the 5th Battle Squadrons, had to expect the British battle fleet would be about. But reconnaissance to the North was hindered by the diminishing visibility, the smother of funnel and gun-smoke, and the unexpected arrival of the 3rd Battle-cruiser Squadron. It was not until heavier artillery salvoes burst among the leading German ships that it was realized that the British battle fleet was taking a hand. With this pressure on his leading squadron, the German C.-in-C. was no longer fully master of his movements; surprise had passed into the hands of his opponent.

During the ensuing operations, both sides were continually being surprised by unexpected situations, which were the result of unfavourable conditions for observation, mistaken impressions, and misleading reports, rather than of deliberate manœuvring by either of the combatants. Even some of the night attacks launched against the German battle fleet by British flotillas were the outcome of surprise encounters; one of the few exceptions to this was the attack made by the XII Flotilla, to which the battleship "Pommern" fell a victim.

An incident which occurred at the height of the action is worth quoting. Just after the first attack by the enemy had been repulsed,[1] the German C.-in-C. decided to "launch a determined attack at once with the help of destroyers." In his subsequent report he explained that "the manœuvre would be bound to surprise the enemy, to upset his plans for the rest of the day, and if the blow fell heavily it would facilitate the breaking loose at night."[2] It was, in fact, the execution of this order which restored to the German C.-in.C. his freedom of action for the night.

Although our van again came under the fire of the British battle fleet, the deliberate attack of our battle cruisers and destroyers, and the

[1] This is a curious way of describing the first precipitate retreat of the German battle fleet, which was the direct result of the British deployment.—EDITOR.

[2] *Vide* "Germany's High Sea Fleet in the World War." By Admiral Scheer, p.155

alteration in the course of the British fleet had relieved the German C.-in-C. from what our Admiralty called "the most unfavourable situation of the whole action."[1]

The return of the German fleet on the morning of 1st June brought them through an ambush prepared by the British. The night before the minelayer "Abdiel" had been ordered to lay a minefield over the course that would probably be taken by the German ships. These mines were laid to the South-West of the Byl lightship, so that only ten sea miles intervened between this new field and another of which we were ignorant, and our ships were, therefore, in considerable danger of unexpected disaster. In fact, the "Ostfriesland," ahead of the flagship, did strike a mine at 6.20 a.m., in the new field, but thanks to her splendid under-water subdivisions she was able to return to harbour under her own steam.

The Belgian Coast and Zeebrugge.

It is astonishing that the English endured for so long the pressure of our submarine headquarters in Flanders, and did not attack them till 1918, when they tried to close the small entrances of Zeebrugge and Ostend. So long as the coast defence was maintained this could only be achieved by surprise. Papers found in a captured C.M.B. in April, 1918, warned us that something of the sort was to be expected, so the surprise was incomplete, and the forces on the spot were not taken unawares when the attack came on the night of 22nd–23rd April. At Zeebrugge they left three-quarters of the channel free.[2] The attempt

[1] The German Admiralty's remark is far more understandable than Scheer's subsequent endeavour to claim that he had secured an advantage by re-engaging in such fashion that the whole British battle fleet lay across the head of his line. Actually, it was not until he realized how desperate his position was that he gave the order to his battle cruisers to "Charge the enemy—without regard to consequences," and to his destroyers to attack and put up smoke screens. This was done to give his battle fleet a chance to turn about once more and escape from gunfire, which must have overwhelmed it.

The essential times are :—

7.12 p.m.—British First Battle Squadron re-opened fire on van of enemy battle fleet. (7.13.—Fleet Flagship "Iron Duke" in the centre of the line came into action).

7.18 p.m.—German battle fleet commenced a 16 point turn away, under cover of their battle cruisers and destroyers' smoke screen. (By 7.20 they were out of sight).

It may be noted that it was not until 7.21 p.m., when there was no other enemy in sight, that the British C.-in-C. altered course, to avoid the oncoming torpedoes from the German destroyers.

There are very clear diagrams of these movements in the R.U.S. Museum.—EDITOR.

[2] Aerial photographs of the position of the blockships prove this to be an exaggeration.—EDITOR.

was, however, cleverly planned, carefully prepared, and executed with great courage. Getting the blockships into place at Zeebrugge was a first-class military and seamanlike operation. The defenders thought themselves secure, but had not expected so good a smoke screen to protect the attackers from the shells of the shore batteries. The English lost about 600 men, dead, mostly from the volunteers in the "Vindictive"; the German losses were trifling. The results were the same as in similar attempts in other wars: the strategic aim was not reached; entry and exit were impeded, but not prevented, and there was no material interruption of our U-boat enterprises.

Operations in Extra-European Waters.

The German light cruisers operating against merchant shipping in foreign waters had a rather limited sphere of action. They dared not attack hostile cruisers, as there were no bases to which they could retire for repairs, if damaged, and successful attacks on cruisers of their own size, naval bases or merchant ships, were only possible by approaching under cover of darkness and catching the enemy unawares. In this way they brought off many cleverly-planned surprise attacks, which were never equalled by our enemies, amongst them being the night bombardment of Madras by the "Emden" and her entry into Penang harbour, the destruction of the Russian cruiser "Schemtshug," and the sinking of the "Pegasus" by the "Königsberg" off Zanzibar. The sinking of the "Emden" by a ship 2,000 tons heavier than herself was the result of an unexpected but not deliberately-planned engagement.

It must be admitted that the British brought off a strategical surprise on the grand scale at Falklands Islands. British trade had been paralysed as a result of the defeat suffered at Coronel, and immediate action was imperative. On the day after Coronel, that energetic First Sea Lord, Lord Fisher, recalled two battle-cruisers from the Grand Fleet, and a week later they had sailed on their 7,500 mile cruise. Nothing betrayed their objective; von Spee did not even hear of them at Abrolhos, and his surprise was complete.

Submarines and Mines.

The submarine is a weapon of surprise. Soon after the war began some thought it had put battleships out of date. It reached its height when the three cruisers[1] were sunk, but almost as important was the work of "U 21" at the Dardanelles in sinking the "Triumph" and "Majestic," and preventing another attack on the Straits.

Their menace was speedily countered by fast destroyers, zig-zagging, nets, depth charges, seaplanes and airships, while coastal waters and sea lanes were searched at night for submarines on the surface. All

[1] H.M. Ships "Hogue," "Cressy," and "Sutlej."

these measures reduced the sinking of warships, for only as many were sunk in the last forty-three months of the war as in the first eight. Yet, in spite of the heroic endeavours of their crews, submarines were unable to end the war. They did not succeed well in the blockade of ports, nor on the expected lines of advance of fleets.

That the unlimited submarine warfare failed was chiefly due to the fact that it did not come as a surprise. While it had been going on, in a modified form, for over a year, the enemy had time to prepare protection against it. England, especially, threatened with famine, had accumulated great stores of protective material; guns were mounted on all merchant ships, thousands of trawlers, patrol boats, and submarine chasers watched the lines of entry to the ports; submarine traps began their cunning work, and hunting underwater craft by sound was developed. Then at last came convoy. The losses of our submarines could have been made good, but the losses of merchant ships decreased too rapidly to give hope of an early decision in our favour. Anti-submarine defences had not conquered the submarine, but they had prevented it from giving us victory.

A good deal of damage was done by mines in recent wars, but their development in the last war made them a far more potent factor than had ever been foreseen. Several hundred minefields were laid by the combatants. A minefield fulfilled a double purpose; to begin with, it took the enemy by surprise, and following the locating of its position it denied them the free use of that area until it had been swept; but it is with the element of surprise that we are concerned. Certain special minefields, skilfully laid by auxiliary cruisers and minelaying submarines, caused the enemy very serious losses, but they were not on the whole sufficient compensation for the work involved. We also lost many small ships by mines, especially submarines; our larger ships were too well guarded by patrols of minesweepers and by their own under-water protection to suffer very heavily. The development of under-water protection during the last war has altered the whole position in regard to mines, and new methods of using them will have to be evolved.

New Types of Weapons.

Of these the C.M.B. and torpedo-carrying aeroplane alone are of importance. The Italians had the greatest success with the C.M.B., for in the spring of 1918 two of these boats met an Austro-Hungarian fleet and sank the newest battleship, the "St. Istvan," with two torpedoes. The torpedo-carrying aeroplane was employed during the war, but had hardly developed into a reliable weapon, with the result that no satisfactory defence against it has as yet been evolved.

Surprise in Future Naval Warfare.

Amongst the conditions governing successful surprise, as mentioned above, the most important was asserted to be secrecy. In the future it will be even more difficult to ensure this element than in the past. New methods of transmitting information are continually being perfected. Since the war, wireless telephony and television have been invented, and even now wireless messages can be sent long distances with the greatest facility. In spite of secrecy and better use of codes, it is becoming increasingly difficult to keep military plans secret.

The development of aircraft is another factor of the same kind that will have to be taken into consideration. Reconnaissance work formerly done by cruisers will in future be performed by aircraft, with the result that news of hostile activity, no matter how distant, will be more easily available. The submarine with its own aeroplane may achieve even more in this direction. On the other hand, ships are continually increasing their mobility and radius of action, while new tactical methods, such as smoke screens, are being improved.

Experience has taught us the value of certain weapons and the uselessness of others. Those that are rejected will, in course of time, be replaced by substitutes, some of which may introduce an element of surprise into a future war. Technique and weapons are but tools in the hand of a master; they are necessary but not decisive adjuncts to successful surprise. The essential element is the determination and personal daring of the leader who plans the operation. A fleet in which these qualities are developed and fostered will not stand inactive waiting for the enemy to attack, but will force him to action by its enterprise and daring. No better example of the true spirit of surprise can be found than that contained in Nelson's letter to Sir Hyde Parker before the attempt on Copenhagen in 1801, wherein he says "The measure may be thought bold, but I am of opinion the boldest measures are the safest; and our Country demands a most vigorous exertion of her force, directed with judgment."[1]

[1] "Despatches and Letters of Lord Nelson." Sir N. H. Nicolas; Vol. 4, p.p. 297–298.

THE STRATEGIC MOBILITY OF AIR FORCES

By Group-Captain C. L. Courtney, C.B.E., D.S.O., *p.s.a.*, R.A.F.

On Wednesday, 22nd January, 1930, at 3 p.m.

Air Marshal Sir John F. A. Higgins, K.C.B., K.B.E., D.S.O., A.F.C., in the Chair.

The Chairman introduced the Lecturer.

LECTURE.

THE necessity for mobility in the application of air power has often been mentioned, but its implications have seldom been studied. Yet the whole subject is of such importance as to merit detailed treatment. Before dealing with it in that light, however, I wish to make it clear that the views I propose to put forward are personal and not necessarily held by the Air Staff.

I will now begin by examining the subject from the following main aspects :—

(i) What do we mean by strategic mobility ?
(ii) Why do we need it ?
(iii) How can it be achieved ?
(iv) What progress has been made in obtaining it ?

I. The Meaning of Mobility.

In the past there has been much misconception as to the meaning of mobility, so far as it concerns aircraft. Let me quote from a recent article which appeared in the Journal of the R.U.S.I., where it is said :—

> " The small radius of action of aeroplanes ties them to bases to a much greater extent than modern warships are tied."

And again, in a recent discussion it was stated :—

> " I venture to question the statement that aircraft are the most mobile form of defence. It is the most mobile, naturally, if that means fast movement within a certain radius, but it seems

to me that in a world-wide problem we must also consider the extent of that radius."

And again :—

"A misleading and subtle claim made for aircraft is extreme mobility. After all, air forces with their equipment for bases and personnel have to be transhipped to the theatre of war to much the same extent as the other forces. In certain cases, even though the distances are comparatively small, where it would be necessary to fly over hostile or neutral countries, the aircraft will themselves need to be so transported."

These and other like statements all indicate considerable misconception of the subject ; they infer that the only claim to mobility possessed by aircraft is that of flying at a relatively great speed within its radius of action from its base.

I think we can all admit that at the end of the late War, such was about the extent of the matter. Not only was this the only kind of mobility possessed by aircraft, but there were few people who had any wider conception of that quality. I remember a statement made at the time that aircraft, within their own radius of action, were the most mobile of all arms, but that outside that radius, they were even less mobile than infantry : and it was about true. Nowadays, however, mobility, as I see it, is not merely a question of high speed. It is also a question of distance ; we clearly want to be able to travel long distances at a high speed. Even so, the matter goes yet further ; it is useless to be able to go a long way very quickly if we cannot act when we get there. So that I would like to suggest that the correct conception of mobility is "to be able to move over long distances at a high speed, and be able to operate effectively when our destination is reached."

I was interested to see that in a recent lecture before this Institution[1] almost identical views on the meaning of mobility were applied to warships. "It will be necessary for future warships to possess great mobility, by which I mean power to proceed where and when necessary, and to maintain themselves there as long as required. Mobility is not only a question of endurance and speed, but also of reliability and independence." That is the goal which we, in the Air Force, have set ourselves. Before proceeding further I must briefly refer to the reasons which have actuated us in doing so.

II. The Need for Mobility.

Much of what I propose to say may be regarded as a series of truisms, more especially by naval officers, since the reasons why we want strategic

[1] "The Fleet of the Future." By Captain J. V. Creagh, D.S.O., R.N., Journal of the R.U.S.I., November, 1929, page 678.

mobility are indeed very similar to those which apply to the Navy. To put it in a nutshell, we want, as all great commanders have wanted, to concentrate our forces at the right place at the right time.

The development of this doctrine in all its bearings with regard to air power is a very wide subject. I need only refer to the many parts of the Empire which would in war be exposed to enemy air attack, and, even more important, the many exposed localities through which passes the shipping on which the existence of the Empire depends. To station air forces at all these points so as to be ready to meet hostile air threats, would mean the expenditure of vast sums of money, and would be an extremely uneconomical way of obtaining the necessary security. We must, therefore, adopt the same principles as have traditionally governed naval policy, that is to say, we must avoid tying down air forces to local defence more than is absolutely necessary; we must develop our arrangements so as to be able rapidly to bring a sufficient force to the threatened point when the need arises.

The Navy owes its mobility very largely to the geographical position of territories under the British flag. A glance at the map will remind us how favourably these territories are situated, while there are in almost every land places belonging to this Empire where we have established naval bases. It is by means of these bases that the Navy has for so long retained its supremacy. Surely air power can take the same advantage of world-wide bases and become an equally great asset.

In some respects it would seem that strategic mobility is, if possible, of more importance to the Air Force than it is to the Navy, for aircraft can range over both land and sea, and can be utilized to assist in defence against all possible forms of land, sea and air attack.

III. Mobility—How Obtained.

The first requirement is to organize a network of air routes leading to any part of the Empire. By organized air routes, I mean essentially routes passing over British or British-controlled territory, with a series of landing grounds or seaplane anchorages suitably spaced. At some of these points there must be fuelling and oiling facilities, and at a few of them, there must be repair facilities and stores of spares and equipment. Lastly, over the whole route there must be an efficient wireless and meteorological organization.

The criticism is often heard that it is impossible to select "All-Red" routes. To some extent this criticism may at present be justified. But if we study the map we will realise that a very large part of our Empire is free from this difficulty. Starting from Egypt, for instance, we can reach Palestine, Transjordan, Iraq, the Persian Gulf, the Sudan,

East Africa, Tanganyika, Rhodesia, and South Africa, without crossing foreign territory. To connect up other parts of the Empire, it will be necessary to increase the endurance of aircraft so as to enable them to skirt any intervening foreign territory. This seems to be the answer to those who question the practical utility of long-distance non-stop flights. As you know, a non-stop flight has recently been made from Cranwell in Lincolnshire to Karachi in India, a distance of 4,130 miles in fifty-one hours. A French aeroplane has done even better, flying from Paris to a place in Manchuria, a distance of 5,000 miles. What is possible now with a specially designed aeroplane using a specially prepared aerodrome, may well be a perfectly normal matter in ten or fifteen years. Incidentally it may be noted (as a well-known aircraft designer recently reminded us), that there are no two places in the world more than 12,000 miles apart.

The organization of landing grounds and refuelling facilities will come about automatically with the development of our Imperial commercial air routes, which have been blazed through the instrumentality of the Royal Air Force. These routes will be provided with depots where repair facilities and stores may be forthcoming. These will constitute, so to speak, the main bases or dockyards, and may be Service depots or civil aviation depots according to circumstances. The wireless intercommunication system and meteorological organization is necessary in order to provide for the despatch of assistance in case of need and to permit of the receipt of timely information of adverse weather conditions.

When air routes have been organized, we shall need to be assured of a reasonable measure of reliability in moving over them and we shall need to provide an organization to enable air units to operate independently from any point on or near them. Reliability is a question of training of personnel, mechanical efficiency and the ability to compete with all but the worst possible weather conditions.

The chief requirements to enable aircraft to operate on reaching their destination are supplies of fuel, oil, ammunition, food, water, spares and general stores. It would obviously be useless to set up an organization for the rapid concentration of aircraft at a threatened spot, if they then had to await the arrival of these necessities by ordinary land or sea transportation. They must be supplied by air during this period, and I do not believe there is any great difficulty in effecting this by means of heavy transport aircraft such as we already possess.

IV. Progress in provision of Air Routes.

We already possess a number of air routes, some of which are organized while some are not.

First there is the route from Egypt to India, originally developed by the Royal Air Force and subsequently adopted by Imperial Airways, Ltd., for their England—India Air Line. It is about 2,500 miles from Cairo to Karachi, and the route is amply provided with refuelling stations. One section, some 1,000 miles long at present passes over Persian territory, but we hope soon to develop an alternative section along the Arabian side of the Persian Gulf which constitutes a sphere of British influence.[1] At Cairo, Baghdad and Karachi, are located well-equipped aircraft depots where supplies of stores are held and where repairs or overhauls can be effected. At these three places there are also located meteorological stations which, with the assistance of subsidiary observing stations, are able to issue weather forecasts whenever required. Covering the whole route is a wireless organization which not only enables the movements of aircraft to be reported throughout, but enables weather reports to be transmitted to aircraft in flight. The route has been operated by Imperial Airways weekly in each direction for the past nine months, and this in itself has resulted in great development of facilities and amenities such as rest houses, bulk-petrol installations, etc. It is possible that a link may, in the future, be developed to connect this route with Aden, and a number of aerodromes along the Southern coastline of Arabia have already been established.

A route across India from Karachi to Calcutta, a distance of some 1,500 miles, has existed for some time, the landing grounds having been selected and marked out by the R.A.F. in India. Quite recently the Section from Karachi to Delhi has been improved sufficiently to permit of regular use ; landing grounds have been made suitable for all weathers and a wireless and meteorological organization has been set up. Within the past month, Imperial Airways, acting on behalf of the Government of India, have extended their line to cover this section, and it is to be hoped that a further extension to Calcutta will soon be inaugurated.

India lends itself to the organization of a number of feeder lines to this main route ; the aerodromes already exist and R.A.F. aircraft can reach almost any part of the country. In the course of time, there is no doubt that subsidiary civil air lines will be organized in order to derive the fullest possible benefit from the rapid means of communication with the Mother Country and other parts of the Empire which the main air line provides.

Next year, we hope to see the main route itself extended from Calcutta on to Malaya and Singapore, a distance of over 2,000 miles. Here again much of the pioneer work has already been done, and, by

[1] See Lecture on The Navy in the Persian Gulf. By Captain R. St. P. Parry, D.S.O., M.V.O., R.N., page 328 of this JOURNAL.

the end of 1930, sufficient landing grounds will have been constructed to permit of operation during the dry season. This section is particularly difficult from the point of view both of topography and of weather conditions. Over the majority of its length, successful forced landings would be impossible owing to the nature of the country, while on the other hand, the prevalence of unusually stormy weather during the monsoon period, that is from June till September, makes it essential for aircraft to be able to land for a few hours. The combination of these two circumstances has made it necessary to construct emergency landing grounds at relatively short intervals, in order to permit of the route being operated with reasonable safety. It may well be that we shall see the civil air line operating this section of our route to the Far East with seaplanes, and we have ourselves a squadron of seaplanes at Singapore. Consequently the work of aerodrome construction has gone hand-in-hand with that of the provision of facilities for seaplanes. The ideal would be to have aerodrome and seaplane anchorage in close proximity so as to enable petrol installations, wireless stations and so forth, to serve both aeroplanes and seaplanes; but this ideal is not always practicable.

The coast line between Calcutta and Singapore lends itself admirably to the operation of seaplanes for there are a succession of islands and inlets affording sheltered water, at which it is only necessary to provide moorings and a refuelling craft. The same applies to the section between Singapore and Australia (some 2,300 miles) which we all hope will be established concurrently with that between India and Malaya. Australia herself is already well provided with internal air routes.

Turning now to Africa, we come to the second great Imperial air route, that from Cairo to the Cape. All the aerodromes on this route have been selected, and Imperial Airways, Ltd., are to start a weekly service next summer from Cairo to Kenya, and right through to the Cape six months later. A branch route exists from Khartum across French Equatorial Africa to Nigeria and the Gold Coast, but this is subject to the strategic limitations imposed by the necessity for crossing foreign territory.

Before leaving this aspect of the subject, I must emphasize once more the need for organization. It is not sufficient merely to have aerodromes, for these alone do not constitute a useful air route. Air routes must be going concerns, and this can only be done if they are regularly used by civil air lines. As soon as a civil air line is in regular operation, all sorts of facilities at once become available, such as petrol, oil, water, wireless, meteorological stations, and rest houses, the expense of which would be prohibitive if they were provided merely against the possibility of moving Service aircraft.

So much then for the first, and by far the most important, group of essentials for air mobility. I think we can claim that good progress has been made in the provision of trunk air routes in the Eastern hemisphere.

V. Reliability.

Now, let us pass on to the second group of essentials and begin with reliability. One frequently meets the criticism that aircraft are too uncertain, too limited by the vagaries of wind and weather, to be relied upon to arrive when wanted. The only way to meet this criticism is to examine what has actually been done.

I might quote the reliability figures of civil air lines, both British and foreign, but it is perhaps arguable that the reliability achieved by pilots and aircraft constantly plying over the same country is no criterion of the ability of Service pilots to fly over unfamiliar routes. So I prefer to cull from experiences gained in the Royal Air Force itself.

Each year for the past four years, for example, a flight of four aircraft has flown from Cairo to the Cape and back, a distance of 5,300 miles in each direction. The 1930 flight is in progress at this moment.[1] These flights are carried out as normal training exercises to a scheduled time-table prepared some months beforehand, and, if a day has been lost occasionally, it has been invariably made up later. Originally, nearly three months were allowed for the double trip, and this time has gradually been reduced until now but little more than six weeks are required, in the course of which training exercises are carried out with local forces in East and South Africa. This time is, of course, much more than what would be required for a regular civil air line, but our object is not to break records, but to accustom units to fly long distances to a pre-arranged programme and to become independent, so far as possible, of outside assistance.

Similar flights are carried out every other year from Egypt to Nigeria and back, a distance of 3,000 miles in each direction. The first flight was done in 1925, and last year the flight was extended to the Gold Coast. Here, again, a scheduled programme is observed, but plenty of time is allowed for exercises in co-operation with the West African Frontier Force and to permit the inhabitants to see the aircraft.

Though all these flights have been very successful, they have not been without incident. The Northern part of the Sudan, for instance, is given to sandstorms, while in the Southern part there is a belt where very severe thunderstorms are usually encountered. In Nigeria there is the hot sand-laden wind from the Sahara, and in the Gold Coast,

[1] January, 1930.

there are tornadoes which occasion most violent air disturbances. Nevertheless these difficulties have been overcome and the flights have been of value not only for training purposes, but also as a means of showing the British flag in places which by other means must be regarded as almost inaccessible.

Going further East, flights have recently been carried out between Calcutta and Singapore, a particularly unpleasant stretch of coast, during the South-West monsoon. I may here remark that the rainfall during this season at many places on the Arakan and Tenasserim coasts amounts to 20 inches in a single month.[1] This is accompanied by low clouds, low visibility and heavy gales.

Four cruises were carried out by flying boats during the months of June, August, September and October of last year in order to obtain experience of the difficulties likely to be encountered in flying from point to point under such conditions. They were not tied to a rigid daily programme, but in point of fact they did succeed in adhering to a tentative schedule prepared beforehand.

The first cruise in June was from Singapore to Rangoon and back, a distance of some 2,800 miles, and was accomplished in seventeen days in moderately bad weather. Several severe storms were encountered, which necessitated the boats flying as low as 20 feet for a considerable distance, while one exceptionally heavy storm made it advisable to come down in sheltered water and wait for an hour or two until conditions improved.

The second cruise in August was from Singapore to Calcutta and back, a distance of some 4,300 miles. This was completed in fifteen days, and the pre-arranged programme was adhered to throughout. An idea of the weather conditions can be gauged from the fact that, during the twenty-one hours flying between Calcutta and Victoria Point on the return journey, at no time could an altitude of more than 800 feet be attained, and usually the boat flew at well below 500 feet with very poor visibility and extremely bumpy conditions.

During the third cruise to Calcutta and back in September, a fractured propeller caused a delay of two days on the outward journey, which was subsequently made up, the trip being completed in fifteen days as before. Heavy weather was again encountered and one particularly severe storm necessitated a landing for a few hours.

The fourth cruise in October, was relatively uneventful. During that month the South-West monsoon gives place to the North-West monsoon and weather conditions are somewhat easier.

[1] Approximately the rainfall in London over a whole year.

I think these cruises give some indication of what can be accomplished. They show that flying boats, at all events, can be relied upon to get through the worst weather with reasonable regularity. It is natural to suppose that land aircraft may find it more difficult. Not only will the aerodromes be more susceptible to flooding, but they are necessarily fewer in number than the many emergency seaplane anchorages which can be found in the lee of the islands with which the coast is studded, and consequently there will be less opportunity for a landing to await the passage of particularly severe storms. But one is encouraged to hope that the necessity for such emergency landings will be avoided by the provision of an improved meteorological forecasting service. I hope that before the end of this year, cruises will be carried out by land aircraft along this stretch and that they will ultimately be able to show as reliable a record during monsoon conditions as the flying boats.

My object has been to show that if it is necessary to effect concentrations of aircraft in any part of the Empire which is accessible by one of our air routes, then the aircraft can and will get there at a speed which is naturally unapproachable by other forms of transport. A year ago events occurred which gave us an excellent opportunity of demonstrating this important feature of air power. Everyone knows about the evacuation of nearly six hundred people from Kabul to India, but I am not sure that it is realised that the large troop-carrying aircraft which took the major part in this achievement were sent at short notice from Iraq, 2,800 miles distant. In all, eight Victoria troop-carrying aircraft were sent in this way, the actual journey from Iraq to India taking two days. On the average, it took four to five days for the aircraft to reach India after the issue of the necessary orders. On arrival at Risalpur, these aircraft were employed more or less continuously for periods varying from ten days to two months, under adverse and trying weather conditions. They were operated and maintained almost wholly by their crews and were dependent upon the small quantity of spare parts that they were able to bring from Baghdad. They were too big to be accommodated in the hangars in India and the work of refuelling and general maintenance was done in the open, and generally at night. Simultaneously with the despatch of these aircraft to India, five machines of the same type were sent from Egypt to Iraq to take their places, a journey which only took one day.

It is interesting to notice that when Sir Francis Humphrys flew last month from Egypt to Iraq to take up his appointment as High Commissioner, he was taken by the same pilot and the same aeroplane as had brought him away from Kabul a year previously.

It may well be some time before it is possible to quote a more striking example of the application of air mobility than the concentration of these transport aircraft in India over immense distances in such a short space of time.

VI. Endurance.

Mobility is naturally closely connected with the endurance, or rather with the range, of aircraft. The longer the distance which can be flown without refuelling, the less dependent we shall be upon intermediate landing grounds, a point of great importance in certain parts of the world. I look forward to the time when aircraft will fly from England to Gibraltar, from Gibraltar to Malta, and from Malta to Egypt, without refuelling. This will mean that aircraft must have a range of but little more than 1,000 miles. I do not believe that this is a matter of any very great difficulty.

The ordinary single-engined bomber of to-day has a range of about 600 miles with full military load, including bombs, and if, instead of bombs, extra fuel tanks were fitted, its range could be increased to over 1,000 miles. It was, indeed, an ordinary standard bombing aeroplane which attempted to fly from England to India in 1927, and which did in fact get as far as Jask in the Persian Gulf. By overloading it to a certain extent it was possible to increase its range to 4,500 miles.

The problem is, of course, very much simpler in the case of the multi-engined heavy transport aircraft such as those which effected the Kabul evacuations. These are designed to carry alternative loads of bombs or men or stores, and if they were enabled to carry extra petrol instead, their range would be increased to 1,500 miles without any overloading. The same figures apply approximately to present-day flying boats.

Long distance non-stop flying has not hitherto been practised in Service units, possibly because of the lack of reliable petrol gauges and also, I think, because the value of such flights has not been widely recognised. I should like to see trophies instituted for the best endurance achieved each year for each type of Service aircraft. Such a competition would certainly stimulate the practice of economical flying: a practice which is almost unknown at present.

With organized air routes, reliability and increased endurance, we shall be in a position to afford mutual reinforcement between those areas in which air forces are normally stationed. Even now we can, and frequently do, move units between Egypt, Palestine and Iraq, in accordance with the changing needs of the situation. It is not sufficient, however, to be able to move units between commands. We want to

be able to put them down in areas where there are no air forces maintained in normal times.

VII. Maintenance.

The last of our essentials to air mobility is the means of providing the day-to-day needs of the aircraft to be moved. It would obviously be useless to organize air routes and to train squadrons to move rapidly over those routes if, when they reach the required point, they cannot be maintained or supplied with the fuel, oil, explosives and general stores which they will need for operations. Consideration of this question of maintenance inevitably involves a certain amount of calculation, but I do not propose to quote more figures than are necessary to prove that this task of maintenance lies within the bounds of practicability.

I think it fair to assume that the base from which it would be desired to operate would seldom be entirely devoid of land or sea communications. The problem, therefore, is to make such arrangements as will maintain a squadron until communication can be established by land or sea. Thus it would not be necessary to send with the squadron the whole of the personnel usually included in its establishment. Fifty men would probably be sufficient to keep a squadron of twelve aircraft working efficiently for a week or two. Similarly it would not be necessary to send, in the first place, the whole of the 15–20 tons of stores usually allowed for the up-keep of a squadron, since these would include sufficient consumable stores to last at least a month. The essential stores for immediate use would weigh 2–3 tons, and the remainder could, like the majority of the personnel, be sent by more normal methods of transport. These figures are necessarily only guess work, for exact requirements can only be decided by trial and error—an exercise designed to investigate such a problem would, I think, be of inestimable value to the Service—but if these estimates of fifty men and 2½ tons of stores are accepted, then five heavy transport aircraft, such as the Victoria, could take these quantities and could accompany the operating squadron to the required point of concentration.

We must next consider the daily requirements of the squadron in petrol, explosives, rations, etc. I calculate these might amount to a maximum of four tons per day. Now one day's requirements could accompany a squadron in three more heavy transport aircraft, making eight in all. Until supplies of fuel and ammunition were available by the ordinary means of transportation, it would be necessary to organize daily supplies by these eight heavy transport aircraft from the nearest available depot. Petrol supplies would be easily obtainable along any organized air route and the necessary quantities could almost certainly be sent forward by two heavy transport aircraft. Ammunition supplies would

present a rather more difficult problem, for it is unlikely that money will be available for the establishment of dumps at more than a very few central depots in the world. One heavy transport aircraft could easily carry the quantities required for one day's operations, from a distance 600–700 miles, so that six could ensure supplies from a depot 2,000 miles distant.

There already exist in both Egypt and Iraq a squadron of ten heavy transport aircraft, and I notice that, in his report on the Kabul evacuations to which I have already referred, the Air Officer Commanding recommends the provision of similar aircraft for India. It would, I believe, be well within the capacity of one of these squadrons to transport the personnel and stores required to keep one squadron going for a fortnight, and subsequently to supply that squadron with its daily needs in petrol, oil and bombs.

In considering this question of maintenance, it should be remembered that in recent years the tendency has been both to make aircraft more easy to maintain and also to train Royal Air Force personnel to exercise resource in keeping aircraft serviceable with the minimum of personnel and equipment. The advent of steel or metal construction has materially lightened the work of maintenance and I think we can claim that the long distance flights carried out during the last few years have proved that aircraft with their crews alone are very much more independent than would have been thought possible ten years ago.

A good example of maintenance by air is furnished by the record of the operations in the Southern Desert of Iraq during the winter of 1927-28. One and a half squadrons of aircraft and four sections of armoured cars were operating from three bases in the desert situated from 60 to 90 miles from railhead, and later from advanced bases distant from 120 to 160 miles from railhead. Much of the country between those bases and railhead was impassable for motor transport, and it was decided to rely principally on a squadron of heavy transport aircraft both in order to establish the advanced bases and to maintain them. Between 9th January and the end of May, 1928, a period of twenty weeks, some 450 tons of supplies, including petrol, oil, bombs, rations and spare parts, were sent forward by air, while during the most intense periods an average of five tons per day was despatched. In his report on these operations, the Air Officer Commanding remarked that it would have been impossible to have maintained and operated aircraft at their bases in the desert without these heavy transport aircraft.

VIII. Conclusion.

To sum up, I regard strategic air mobility as a quality which enables air units to move over long distances at relatively high speed and to

operate effectively on reaching their destination. This quality is essential to efficient and economical employment of the Royal Air Force in Imperial Defence.

To obtain it, our first and foremost need is a system of organized air routes. Some of these exist already, but we shall not be satisfied until we can reach any part of the Empire by air without crossing or landing on foreign territory. Secondly, we need to develop reliability in flying over these routes in all weathers. Thirdly, we need to increase the endurance of our aircraft, both to reduce the number of necessary refuelling grounds and to enable us to cover long stretches of sea which may intervene between our possessions. Lastly, we must develop our means of maintenance, both by constructional methods and also by arranging for adequate numbers of heavy transport aircraft to carry essential needs.

The result of these measures will be to increase the mobility of the Air arm to an extent which must very largely influence its peace distribution. That distribution must not only take into account the areas where aircraft can most usefully be employed under peace conditions, but also their readiness and ease of movement to other theatres of operations in emergency. Under such a system, the air strength to be maintained, for example in Egypt or India, would be fixed not merely in relation to local defence requirements, but also in relation to possible contingencies in the whole of the Middle East or Far East respectively.

In this way, air forces will be enabled to concentrate at the right time and place, whether for the purpose of safeguarding trade routes, for the protection of ports, for the defeat of enemy air concentrations or for movement with other forces of the Empire into any theatre of war.

DISCUSSION.

REAR-ADMIRAL E. ASTLEY-RUSHTON: I only wish to put a few questions. Firstly, can we be told what is the maximum distance which is allowed to separate landing grounds on these air routes? That would give some idea of the amount of work involved both in the preparation and upkeep of such routes. Secondly, with regard to economical speed, a matter which in my Service is one of great moment, it would be interesting to know what is the percentage range of fuel saving as between the maximum speed at which aircraft can fly during strategical flights and the lowest speed at which they can fly without coming to grief. We are told that it is the hope of the Air Force to achieve such a position that any part of the Empire can be reached without landing on foreign territory. In view of our achievements up to date, that sounds a very large order. Of course, the miracle of to-day is the commonplace of to-morrow. It was stated that the present aircraft, after certain alterations have been made, could be fitted so as to fly 1,000 miles without the necessity of landing. But in order to be sure of accomplishing 1,000 miles they might have to carry sufficient fuel to be able to

fly perhaps 2,000 miles through the air. If that be so, how are we to get to Canada? I notice that that part of the Empire was not included either in the map shown by the lecturer or in his remarks. Finally, I should like to ask how we are going to get over the great preliminary jump across Europe before we can touch any point in the British Empire. Malta is a long way off; so is Gibraltar where, moreover, landing presents, I understand, considerable difficulties.

Captain C. F. Webb (Manchester Regiment): I feel that the strategic mobility and possible concentration of our Air Force must influence to some extent the strategic mobility and concentration of our Army. The excellent performance put up in the relief of Kabul was facilitated in great part by the fact that the Air Force had strategic stations at the time in Iraq and at Aden, which had the necessary troop-carrying planes at hand. Having regard to the topographical or geographical situation, would it be possible to have a station in Burma? Would it be possible for the Royal Air Force to take up the independent command of a country like Burma? I have heard arguments for and against that policy from my colleagues. I understand this has always been dependent on finding suitable landing grounds such as the Air Force is able to obtain in Iraq.

Sir Edmund Barrow: Could the lecturer tell us anything about the routes along the Chinese coast, starting from Hong-Kong up towards Shanghai?

The Lecturer, in reply, said: In regard to Rear-Admiral Rushton's question as to the distance apart at which landing grounds ought to be situated, I find it rather difficult to give a definite answer, because it depends almost entirely upon the topography of the country concerned. In a country like India, for example, there is little difficulty in finding in the plains a place to come down in emergency. I think that in country similar to the plains of India or Iraq, made landing grounds might be about 300 to 350 miles apart. On the other hand, on the coast of Burma, I should say that emergency landing grounds should be 150 to 200 miles apart, because there are but few natural landing places.

Economical speed depends upon the type of aeroplane and other factors. As a rough estimate, I think if one wanted to fly 1,000 miles, it would be quite a reasonable proposition to carry petrol for 1,200 miles, on the understanding, however, that one had a good meteorological organization.

Admiral Rushton criticized my statement that all parts of the Empire would eventually be accessible by air, and remarked on the fact that I have only dealt with the Eastern Hemisphere. The reason is that at present British air routes exist only in that Hemisphere, although a start has just been made in the West Indies. But I mentioned in the course of my lecture that already aeroplanes have done non-stop flights of 4,000 and 5,000 miles, and the experience of the past, I think, has shown that what is possible to-day for a specially designed aeroplane will eventually become quite feasible for normally designed Service aircraft.

Admiral Rushton also referred to the fact that at present England is cut off from these African and Asiatic air routes; that is perfectly true. There are only two ways of avoiding the difficulty; one is by organizing in the future an air route *via* Gibraltar and Malta; the second is by arranging that we have an adequate air reserve in Egypt so as to make it unnecessary to call upon the forces in England. It does not seem to me to be at all beyond the bounds of possibility to fly from England to Egypt *via* Gibraltar and Malta. The aerodrome question at Gibraltar is, I understand, one of recreation grounds, and the undesirability of encroaching upon them, rather than anything else, ties our hands.

Captain Webb referred to troop-carrying. We attach the greatest importance to that subject, and the organization of air routes and improvement of air mobility would, of course, be as useful for troop-carrying purposes as for any purely air purposes. I think I am right in saying that the first reinforcement to arrive in Palestine last August consisted of fifty men carried by air from Egypt.

As to his question about Burma, I do not know a great deal about that country. I understand that it is a difficult country in which to construct aerodromes, but I believe that, if we wanted to construct them there, we should be able to do so.

Sir Edmund Barrow referred to the possibility of developing an air route along the China coast. On the map I did show a projected link from Singapore to British North Borneo. That would bring us just within range of Hong-Kong for the present-day flying boat, slightly over-loaded. It has not been done so far, and therefore I did not emphasize the point, but I certainly think the China coast is one which should not be neglected so far as our programme of developing air routes is concerned. So far, the only aircraft employed in those waters are those carried in the aircraft-carriers of the Navy.

THE CHAIRMAN:

AIR MARSHAL SIR JOHN HIGGINS: There are just one or two points which I should like to touch upon myself. First of all, I think that the lecturer was quite conservative in his estimates of the range of even present-day aircraft, and some of his hopes which pointed, as he thought, to the rather distant future may be realised after a shorter period of time than he supposes. We have now quite a number of flying boats which can fly 1,500 sea miles—not land miles—without re-fuelling. A boat is building which we expect to do 2,000 sea miles. That boat, I think, could fly to Malta without re-fuelling or touching anywhere, and any of the other boats I alluded to could fly to Gibraltar. The ordinary machine that is now being used as a kind of "hack," a general purposes machine, in Iraq and the Middle East, provided with extra tanks which can be and have been fitted, can fly not only a thousand miles but can give the necessary margin of safety required to fly a thousand actual miles, not theoretical miles, with even more of a margin than 20 per cent. I quite agree with the lecturer that 20 per cent. is a very reasonable margin, supposing a proper meteorological service exists.

With regard to the troop-carrying aeroplanes of the more or less immediate future—by that I mean not imaginary aeroplanes but aeroplanes actually in the process of being built—these will certainly be able to do over a thousand miles in actual distance with their usual load.

There is just one other point that I thought perhaps I might allude to, namely, the question of Burma. I think that if anyone had seen photographs of the country on which the present aerodrome at Singapore now stands, before it was built, he would not be in very much doubt as to our ability to build an aerodrome anywhere.

The customary votes of thanks to the Lecturer and to the Chairman were put to the Meeting and carried by acclamation. The proceedings then terminated.

THEORY AND PRACTICE OF MECHANIZATION

By Lieutenant-Colonel A. G. Baird Smith, D.S.O.

CERTAIN recent discussions of the Mechanization problem, which have appeared in the Journal and claim to be based on the training exercises carried out during the last three years and the experimental Armoured Formations associated with them, seem to invite criticism.

In "The Future of Mechanization"[1] Captain Wade has dealt chiefly with the tactical use of medium and light tank formations, and the degree of support they may require from cavalry and infantry. He explains that his views were based on the performances of the "Armoured Force" of 1927–1928. Therefore, it is not surprising that he does not always agree with Captain Liddell Hart, who treats of the Army Exercises of 1929 in the same number of the Journal.[2] A strong sidelight is thrown on the whole question by a lecture delivered before the Institution on 23rd February last by Colonel D. C. Cameron.[3]

The experimental "Armoured Force" of 1927 was conceived to act as an Independent Formation, and to attempt to carry out functions similar to those of Independent Cavalry. Of these functions the more detailed work of reconnaissance, or the conduct of a pursuit in enclosed country, or the work of night outposts, appeared then to be rather beyond the power of mechanized units. It would be necessary, therefore, according to Captain Wade, to attach to any Armoured Formations a proportion of light cavalry; this could at least ensure a detailed reconnaissance being carried out. Otherwise, the Armoured Force appeared capable of doing nearly all that a normal force, based on infantry, could do—presumably quicker and with less expenditure of effort. Only it could not undertake to "hold" a position captured from the enemy, nor could it always protect itself when at rest, particularly at night. For both these purposes "ordinary" infantry would have to be employed; in the first instance, because stationary armoured vehicles offer an easy

[1] R.U.S.I. Journal; November, 1929. "The Future of Mechanization," p. 695.

[2] R.U.S.I. Journal; November, 1929. "Army Exercises, 1929," p. 789; Capt. B. H. Liddell Hart.

[3] R.U.S.I. Journal; November, 1929. "The Supply of Mechanized Forces in the Field," p. 744; Colonel D. C. Cameron, O.B.E.

target for artillery and aircraft, and in the second because, it is suggested, enemy infantry might be so enterprising as to creep up under cover of darkness, bomb the machines or lay down mine-fields around them. If this last disability be accepted, then the Armoured Force in the dark will bear small resemblance to a " tiger in his lair," even when formed in laager or " wagenburg ";[1] it must depend on infantry for its protection. That it should find its own outposts, or " hold " what positions it has gained, is not, apparently, possible ; " protection troops require," says Captain Wade, " to be withdrawn at night like cavalry "—in fact they cease to be a protection to the main army or even to themselves.

This, after all, only amounts to saying that all protective work at night must fall, as ever, to infantry. For an average half of the twenty-four hours, while machines and mechanics retire for rest and overhaul, the fate of armies will rest in its hands. That its historic roles of night-watchman and caretaker may be made to seem more appropriate, Captain Wade suggests calling it by another name—not infantry, but " Occupation Troops."

This notion of having a special corps of " occupiers " is not quite new. In 1927 several newspapers published inspired articles on the New War, which was to be carried on exclusively by the " mobile might " of Armoured Formations ; and it was further explained that behind the fighting machines would come, first a few metamorphosed infantrymen, to " hold " positions, and secondly a large force of armed " occupiers," a kind of bailiffs, whose easy task it would be to keep order in an enemy's cities and countryside. It seems to be overlooked that such infantry as are required to " hold " one of these tiresome positions, which sooner or later crop up in all such discussions, may, even at night, have to defend them against counter-attack. And since no European enemy at least is ever likely to be merely a " man-power," " cloth-clad," army, the defence may have to contend with gas, bombs, tanks, and all the paraphernalia of modern war. The infantryman is confident that, given time to construct proper defences, with his own weapons and with adequate artillery support he can maintain himself against all these ; but several writers on Mechanized War seem to assume that any charge of light tanks can be trusted to turn him out. A position, if the infantry is to be expected to " hold " it, must, of course, be sufficiently manned and organized in depth against that " infiltration " which Captain Liddell Hart appears to consider irresistible.[2]

[1] R.U.S.I. JOURNAL ; November, 1927. " Army Training, 1927 " ; Capt. B. H. Liddell Hart, p. 746.

[2] " The English Review " ; December, 1929. " The new British Doctrine of Mechanized War " ; Capt. B. H. Liddell Hart, p. 691.

If the infantry could be conceived as only having this night duty and this "occupying" or "holding" of positions to do, it could still hardly be described as "superfluous"—in fact, it would be absolutely indispensable. At daybreak the Armoured Force, being as it were watered and fed, may be able to continue its headlong career of victory; while the infantry, though in need of sleep, either follows, as Captain Wade suggests, by manœuvring over long distances at the double, or more happily on wheels. Of course, a combat remaining stationary for more than a day is conceived as very improbable by those who anticipate, on paper, the course of a normal "mechanized" battle. Still, it is possible to imagine the opposing machineries so nearly equal in strength, that a much longer "deadlock" might result. The infantry would then have to continue "holding"; and, in the case of defeat, would probably furnish the only coherent semblance of a rearguard.

The estimated proportion of "light" infantry to each armoured division of an Expeditionary Force is placed by Captain Wade at three battalions; and Captain Liddell Hart favours battalions (but provided with armoured "pill-boxes") of not more than 500 men. The frontage of any positions to be "occupied" by infantry must, then, either be very short or they must be very thinly manned. Captain Wade would further deprive the infantry of its "anti-tank" guns; but since Captain Liddell Hart seems to consider these guns "a poor counter to mobile tanks,"[1] perhaps this deprivation will not materially increase the initial handicap under which, as usual, the infantry will proceed to pull the chestnuts out of the fire.

Colonel Cameron rightly says that "the first idea of a mechanized force is to move fast and to hit hard."[2] But, unlike some, whose sole idea this seems to be, he also allows that "the force must be tied in some way by a regular current of supplies," since petrol is its "life-blood" which it must receive certainly and in very large quantities. In consideration of the expected performance of an armoured Expeditionary Force, which, it seems, may embark on strategical moves of 100 or more miles a day, this question of fuel supply is of the greatest moment. The protection of the "life-blood" arteries of mechanized formations will be their most absorbing anxiety; since an obstruction might, at any moment, mean an irretrievable disaster. The collection in depots or "dumps" of such inflammable and explosive supply must, Colonel Cameron proposes, be avoided as far as possible by wide distribution

[1] R.U.S.I. JOURNAL; November, 1929. "Army Exercises, 1929"; Capt. B. H. Liddell Hart, p. 794.

[2] R.U.S.I. JOURNAL; November, 1929. "Supply of Mechanized Forces in the Field"; Colonel D. C. Cameron, p. 747.

over the back areas of the theatre of operations. A technical problem, it will be said: yet it is the first that must be solved, before free rein can be given to the far-reaching ambitions of the new strategists.

In discussing the Army Exercises of 1929, Captain Liddell Hart states that the "offensive power" of the infantry brigade had "dwindled almost to zero." In peace-manœuvres, it may be remarked, the gauge of "offensiveness" of any arm is the opinion of the umpires; and no one would claim for them any degree of infallibility. It appears, however, that an infantry brigade is capable of acting as a "supplement" to "mop up" the mess made by the light and medium tanks in their successful assaults; while it can "take over" captured ground. What this "mopping up" and "taking over" would involve in real war, the writer does not stop seriously to consider; indeed, rather than lose the "strategic mobility" of the tanks, he would dispense with the handing-over business, and let the positions look after themselves.

In the attack on such positions the role of the light tanks may be that of screen to the medium tanks, to draw the fire of the enemy's anti-tank guns, and to probe his defences.[1] Apart from the fact that the appearance of the light tanks in screen formation would, sooner or later, inevitably announce the coming of the larger machines, the function of a screen is not so simple as it may appear on paper. The old-time cavalry screen had its plainly defined functions, when no inquisitive eyes could see from the sky what was behind it; and occasionally, but rarely, an infantry screen, in the shape of an outpost line, or a flank or rearguard, might hide the movements of other troops. But nowadays, without command of the air, such screening is very nearly useless for purposes of concealment. Without a smoke-screen, a gas-cloud, or a barrage, the suggested "probing" of a position armed with anti-tank guns would not be likely to end, so far as the light tanks are concerned, in rash "in-fighting" attempts, such as were witnessed at the last manœuvres.

What would be the result of attempting thus to "draw the fire" of a powerfully posted enemy? Probably his artillery would lay down a barrage through which the second line of medium tanks would have to pass. It does not seem feasible that light and medium tanks should consult as to the character of the enemy's opposition, when once the attack has begun; or decide on the spot whether to "go ahead" or to "convert themselves into stationary machine-gun nests"[2]—the time

[1] R.U.S.I. JOURNAL; November, 1929. "Army Exercises, 1929"; Capt. B. H. Liddell Hart, p. 791.

[2] R.U.S.I. JOURNAL; November, 1929. "Army Exercises, 1929"; Capt. B. H. Liddell Hart, p. 791.

for such heart-searchings would be past. It may be that some " candid artilleryman " can hardly hope to make a direct hit on one of the light tanks, except by accident ; but a sufficient volume of fire would provide that enough of such accidents should occur.

The " Mongolian method," by which presumably Captain Liddell Hart means the Parthian tactics of close approach, a volley of arrows, and a wheel to a flank at speed, as often used by Asiatic horsemen against Byzantine legionaries or mail-clad Crusaders, would, of course, have been utterly futile against long-range firearms. The fact that a modern army will possess every variety of small and great artillery known to contemporary military science will put any such provocative prancings by tanks completely out of court. If the enemy is " found to be strong " in counter-weapons, the subsequent action of the screen of light tanks will probably be influenced by that adverse circumstance alone, with no reference to the " Mongolian method."

On the subject of cavalry, opinions are not so confidently expressed. The organization of " half-horse, half-machine," cavalry finds little favour with Captain Liddell Hart, who believes that the fewer horses it possesses, the more efficient it will be ; he has no need of Captain Wade's light cavalry for reconnaissance. Somehow this is a question of " logic " ; and " logic " it seems is all for machines. Yet experiment and experience, and the brains of cavalry soldiers, will doubtless produce in time a workable, if illogical, compromise.

If the technique of the New War appears somewhat disjointed, its theory is still more so. According to some writers, a new British doctrine is becoming " crystallized " in the minds of staff and regimental officers ; and if this petrifying process—by which doctrine is not necessarily clarified—is not to result in a too definite, rock-like consistency of ideas better kept fluid, the equivocal lessons of these recent peace-time experiments should be carefully sorted and examined in the light of actual war experience.

There is now the new " strategic weapon " of Armoured Formations ; which " may nullify both the gaining and the holding of positions, and by manœuvre against the enemy's supplies cripple him without a fight, thus saving thousands of lives."[1] This, of course, would be the ideal war with which the League of Nations could hardly interfere. But this conception is not new ; it is at least 150 years old. Clausewitz deals briefly with it : " it is a wrong but extremely subtle idea, which supposes it possible, through the use of a special artificial form, to effect by a

[1] R.U.S.I. JOURNAL ; November, 1929. " Army Exercises, 1929 " ; Capt. B. H. Liddell Hart, p. 793.

small direct destruction of the enemy's forces a much greater destruction indirectly."[1] This notion of bringing about a " strategic paralysis " is a favourite with modern theorists. It may, however, be easily understood how the modern conditions of world transport, and the multitudinous streams of supply to an enemy make any local " paralysis " on a European battlefield of very transitory effect on that enemy's powers of recuperation ; the will of a nation-in-arms cannot be subdued by the temporary starvation of portions of its armies. The only " strategic weapon " devised, that has so far approached the desired achievement, was used against Great Britain herself, and not used on land.

The scale of the last European war, which may equally measure the next, must be constantly borne in mind when constructing a strategic theory ; this can never be worked out on a penny atlas. The exiguous British Expeditionary Force of the future, even if completely armoured and mechanically propelled, might inflict nothing more than a deep wound on the great body of its adversary ; such a wound, no more mortal than many inflicted by " man-power " forces, even if measured in terms of a Tannenberg or a Caporetto, may well fall short of decisive effect through the vast dimensions of the war as a whole.

Not for the first time, Captain Liddell Hart toys with the attractive idea of avoiding battle altogether, and of achieving victory by other means. " If the enemy like to sit in positions, let them, while the Armoured Force interrupts their supplies or transfers its fire-power to fresh points where it can similarly paralyse other bodies of the enemy " ;[2] or—" an Armoured Force might reduce a vast infantry army to inertia." These are agreeable day-dreams ; there is hardly any limit to what an Armoured Force might be conceived as accomplishing, given a sufficiently stupid enemy. But a competent commander, it need hardly be said, will not nowadays put a " vast infantry army " to " sit " in positions, merely for the fun of the thing ; he will occupy such places for definite objects, such as to cover the movement of his other forces, to deny approach to some important area, perhaps to guard against just such adventurous irruptions on his rear lines as an Armoured Force may be tempted to undertake. The tendency to assume that all the strategy, all the " mechanical-mindedness " and every new conception of the Art of War are going to be found on one side alone, sooner or later must lead to a disastrous disillusionment.

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[1] " On War." Clausewitz. Book IV, chap. 1. ; translated by Col. J. J. Graham, 1908.

[2] R.U.S.I. JOURNAL, November, 1928. " Armoured Forces in 1928 " ; Capt. B. H. Liddell Hart, p. 728.

The strategy of the past half-century is comprehensively described by Captain Liddell Hart as "shunting."[1] To this the newest strategy will bear no resemblance; while our old friends, "the super-mobile Mongols," will dictate the appropriate tactics. "Wide manœuvre and the attack on the enemy's rear" are to take the place of any such bull-like proceedings; although perhaps, now and then, if nothing else will serve, something more resembling the "Battle-Cruiser Tank Battle" of Colonel Fuller[2] will be staged, and the entire enemy G.H.Q. be "mopped up." The aim would be the same, though different in degree, an apoplexy instead of a creeping paralysis.

According to Captain Liddell Hart,[3] there existed in 1914 two schools of military thought; the first, Napoleonic—which embraced all the Continental General Staffs—and the second, consisting of the few non-professional disciples of M. Bloch of Warsaw. The latter, it seems, proved a true prophet—on one front at least something resembling his predicted "deadlock" did actually materialize. The first school entered the war full of antiquated ideas about the theory and practice of their profession, whereas they ought to have realized, like M. Bloch, that their huge "man-power" armies were already useless. In only one particular—a not unimportant one—were they certainly wiser than M. Bloch; a decisive result, though it took four years, was at least achieved—whereas M. Bloch had maintained that no such thing was possible.

We are told[4] that as early as October, 1914, "several men in high position"—not in the military sense—realized the cause of the "deadlock," and took the necessary steps, that were not obvious to the respective Commanders-in-Chief. Presumably they imagined, invented or designed those mechanical aids to victory, without which Ludendorff himself was doomed to failure.

How easy in the light of after-knowledge does the successful conduct of a great war seem to be, once the key of the mystery is in our hands! A few consultations between some M. Bloch and an open-minded General Staff, a calling into council of two or three eminent outsiders, followed by the mass-production of whatever engines are recommended, and the "futility" of stereotyped war can always be avoided. But

[1] R.U.S.I. JOURNAL; November, 1928. "Armoured Forces in 1928"; Capt. B. H. Liddell Hart, p. 726.

[2] "On Future Warfare." Colonel J. F. C. Fuller, C.B.E., D.S.O., p. 99.

[3] "The English Review"; December, 1929. "The new British Doctrine of Mechanized War"; Capt. B. H. Liddell Hart, p. 688.

[4] "The English Review"; December, 1929. "The new British Doctrine of Mechanized War"; Capt. B. H. Liddell Hart, p. 690.

the commencement of no war known to history has ever waited on the irresponsible lucubrations of such an amateur War Council.

In all probability, the new strategy, with whatever forces and means it is to be carried out, will greatly resemble that of the past. " Indirect approach " to an enemy, or " direct," these have been alternative methods employed by great commanders, according to circumstances, with varying results ; here again, it cannot be assumed that the enemy is a fixed point—the indirectness of his movements may equal one's own. The ideas, sound in themselves, of operating against an enemy's supplies, in order to " paralyse " him, or of marching wide of his flank to fall upon his rear, are, of course, amongst the first primitive notions of war. It may, too, be useful to remember that it is not the commander who thinks of such and such a ruse who in the end is always acclaimed a " master " ; but rather the fortunate one who succeeds in carrying it out. In other words, it is often easy enough to comprehend what has to be done ; the difficulty lies in the doing.

To assume, then, that the course of some problematical future campaign, whose nature, dimensions and *mise en scène* can only be guessed, must, because we so wish it, be totally at variance with all experience is surely to make of the Art of War what Clausewitz called " a real business for Brahmins."

THE TANK WAR OF 1946

(*From the " Militär-Wochenblatt " for 25th February*, 1930).

THE gigantic technical progress made during the past generation had been steadily effecting certain fundamental and revolutionary changes in the military organization of Europe. Universal compulsory service had been abolished. A small professional army, motorized and armoured, and thereby endowed with prodigious mobility, was the bedrock on which rested the military organism of each one of the Great Powers. France had erected a tank-proof defence system on her frontiers, so that a barrier line, Belfort-Verdun, covered her Eastern boundary, while the fortified camps of Lille, Maubeuge, La Fère and Reims, protected her to the North. Even Paris had been rendered safe against a *coup de main*. Belgium, on the other hand, had remained content to convert Antwerp into a tank-proof " fortress of refuge."

Under these altered conditions no road remained open for a German attack on France except through Belgium and thence down the basin of the Oise. So while the French Tank Army was mobilizing in Lorraine for a thrust on Mainz, the German armoured forces effected a surprise invasion of Belgium, and headed straight on Paris. One night after another they covered 100 miles at a bound, until, on the morning after their third night's advance, they stood before Paris. There the attempted *coup de main* broke down.

In the " flag-tank " of the French land fleet information as to the progress of the hostile motor raid had been complete ; just as complete as it was in the fortified zones. The newly-established network of radio stations was composed of parallel lines of stations, each line thirty miles distant from the next. These stations, served by special civilian personnel, had not been discovered in the hurry of the German advance and had, therefore, escaped destruction. So they had been able to serve their purpose only too well. The German armoured forces were now reported as having withdrawn into the forest of Compiègne, there to give the crews a hard-earned rest and a chance of attending to their machines. From Belgium and North France further reports now streamed in to the French command. Strong motorized and armoured reinforcing

echelons had followed close on the invading forces. Mobile armoured supply depots had been located at Nivelles and Bapaume: a regular supply system was in full operation along this line from Germany to the front. During the previous night the northern French fortresses had been strongly attacked by the German air forces with gas, high explosive and incendiary bombs. But the bomb and gas-proof shelters had not been seriously damaged.

Now the moment for action had come. A long night advance brought the French armoured forces into the area round Hirson. This move remained undetected, since the Germans clearly could not rely upon the same advantages of communications in enemy country as the French command enjoyed in its own land. Consequently, it had not escaped the latter's knowledge that the German armoured supply depots had effected a move. On the very morning following this operation the leading German armoured depot was subjected to a combined attack by the French armoured and air forces. The remaining rearward armoured depot, on the subsequent approach of a French armoured force, hurriedly withdrew to seek the protection of the fortress of Cologne.

The German armoured forces were in a sorry plight. It is true that they had been able, at any rate partially, to replenish their stock of fuel, but without any assured renewal of all supplies a continuation of the operation in hand was becoming impracticable. The only course of action was a withdrawal. But in Belgium, the Germans now learnt, there stood French armoured forces. To run the risk of a pitched battle, in view of the scanty supplies available, was not to be thought of. To force the fortified line Belfort-Verdun was out of the question—it was impenetrable. There remained the possibility of an attempt to cross the river Meuse between Namur and Verdun. Here, however, the Germans would have to reckon with the Ardennes country and the deeply-cut valley of the river Meuse, which lay right athwart the line of retreat; and this country was easily blocked since, away from the roads, it was impassable for tanks. But the menacing fuel situation rendered no other course of action practicable.

On the French side the position had been appreciated on analogous lines. The French commander-in-chief acted accordingly. Motorized columns had been pushed out of Verdun northwards at full speed. At every crossing over the Meuse and eastwards in the Ardennes detachments, armed with anti-tank equipment and weapons, had been posted, so that the German armoured forces found themselves enmeshed in a formidable defence system that entirely blocked their retreat. Only a small percentage succeeded in cutting their way through. The bulk surrendered without even a battle.

France accordingly believed herself the victor. After a brief pause her armoured forces invaded Germany which, after the loss of her tanks, seemed helpless. The forcing of the Rhine was rapidly effected; the defence crumpled up, and the French advanced to the river Weser. Confident that the surviving fragments of the German armoured forces were now valueless, they imagined their long lines of communication to be safe against serious attack. Fondly they imagined themselves masters of a defenceless Germany. Nevertheless, even while the French armoured forces were straining every nerve to reach Berlin, unpleasant incidents were taking place in their rear. Regardless of all loss, the few surviving German armoured units attacked the French communications. Bridges were being blown up between the Weser and the Elbe; there were hitches in the French supply system. Finally, the invading armoured columns had to turn back, for fear of coming to a like end that had overtaken the German tanks on the Meuse. The first game was thus left drawn.

The armament programme of the Powers that had been set in motion since the outbreak of war soon was to place new armoured armies at the disposal of their High Commands. Up to date the events of the first weeks of war had proved the dependence of the equipment of modern armies upon a constant and easy flow of supplies. The solution to this new problem was now thought to be the carrying forward of a secure base of operations into the enemy's country. So there set in a period of attack on hostile fortresses and bases. Instantly there appeared armies, composed chiefly of armoured artillery, in front of the adversary's fortresses. The latter sought to hinder the sieges by threats against the invader's lines of communications, varied here and there by actual attacks. Fortresses were taken and retaken. Thinly-occupied lines of investment, liberally strengthened with armour-fighting armament, played a great part in this type of warfare. The campaign began to drag on tediously with seemingly little hope of a decision. Then a far-seeing and futuristic brain suddenly reproduced the divisions of 1918, but armed them generously with every kind of armour-fighting weapon. The tanks were given the tasks of ground reconnaissance and of battle cavalry. In a moment the new armies broke through the weak opposing lines of investment: war once more found the mobility which it had enjoyed in the good old days of Cæsar and Napoleon, and even partially at moments during the Great War.

* * * *

Phantasies! Yes: but they seemed to be called for, since it is essential first to undertake a thorough study of the supply problem on

the basis of the proposals put forward by Fuller[1] to show how extraordinarily sensitive the communications of such an army as he predicts may prove.

Moreover, the further such an army advances into hostile country, the more sensitive it must become. The mechanical army must die of inanition unless it can be regularly fed. We can thus conclude that strong ground forces are required to secure the country in rear of advancing armoured forces, and so to enable the bases of their supply to be pushed forward ; that battles must, consequently and automatically, develop outside the radius of these armoured forces, for these cannot be ubiquitous, while they must be conceded periods of rest for maintenance and repair ; that battles of the ground forces might well prove decisive if the latter are supplied in adequate quantity with armour-fighting equipment of sufficient power ; lastly, that in any great national army, armoured forces will lapse back into the state of an auxiliary arm and of an arm of opportunity.

The description given by Fuller evokes a picture of his Tank Army landing at Boulogne and reaching Waterloo in three stages, there to fall upon the right flank of the German First Army, which, naturally, would not possess any armour-fighting equipment and would not even seem to be aware of its existence ! This phantasy has tempted us to let phantasy answer phantasy : to set up against the tank phantasy another phantasy, built up on armour-fighting armament and supply difficulties.

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[1] Fuller, " The Army of the Artillery Cycle "; " Journal of the Royal Artillery," October, 1926.

THE NAVY IN THE PERSIAN GULF

By Captain R. St. P. Parry, D.S.O., M.V.O., R.N.

On Wednesday, 19th February, 1930.

Vice-Admiral B. S. Thesiger, C.B., C.M.G., in the Chair.

The Chairman began by introducing the Lecturer, adding that Captain Parry had recently served for two years as Senior Naval Officer in the Persian Gulf.

LECTURE.

IN order to understand the situation with which the Navy has to deal in the Persian Gulf to-day, it is necessary first of all to go back some three centuries and enquire:—(*a*) what took us into that interesting, but most uninviting, part of the world; and then see (*b*) what are the interests and obligations which have kept us there and must do so in the future?

During the XVIth century the Portuguese had made themselves masters of the Gulf, and thereafter held supreme control of the valuable trade in silk, which they carried on with Persia, though unsuccessfully challenged from time to time by the Turks and Persians. Then, towards the end of the century, the eyes of Englishmen were drawn towards that part of the world, by the desire to share in the rich trade between India and Persia.

Early English Prospectors.

In 1583, one Ralph Fitch, in company with three other adventurers, was sent with letters from Queen Elizabeth to the King of Cambay and the Emperor of China. They travelled overland to Basra, and sailed down the Gulf to Hormuz, from whence, after many adventures, Fitch, in 1591, returned home with a glowing report of the rich trade possibilities which lay in those waters and further East. This led to the formation of the East India Company and the despatch by them of trading fleets to the East. It was not, however, until 1616 that the first English vessel, the "James," was despatched from Surat to Jaskh with a considerable quantity of goods for Persia. The Portuguese made every endeavour to stop this vessel, but failed.

By 1619 a factory had been established at Jaskh, and overland trade with the Persian capital was carried on from there until Bandar Abbas was opened to the English in 1625.

Three years later the East India Company's and Persian fleets combined against Portugal, and proceeded to capture Hormuz, which was shortly afterwards restored to the Persians. As a result of this lawless enterprise, the Shah of Persia granted trade facilities to the English, which allowed them to purchase any quantity of silk anywhere in Persia, and to import their own goods without any import duty. From then onwards the power of the Portuguese began to wane, and they found their trade supplanted by that of the English and the Dutch, who, attracted by the commercial possibilities of those parts, had likewise put in an appearance.

There now arose a period of political and industrial rivalry between the newcomers, each striving to obtain a monopoly of the trade with Persia. In spite of this, however, the Dutch and English combined their fleets to complete the defeat of the Portuguese. From 1640 to 1649, disaster after disaster overtook the latter. In 1643, the Iman of Oman captured Sohar, which had been in Portuguese hands some twenty years; in 1648–49, the Arabs besieged and took Muscat, and by 1650 the Portuguese had lost their entire hold on Oman. Two years later, hardly a trace of their regime in the Gulf remained.

Meanwhile, the struggle between Dutch and English continued, and by 1640 the former had attained a position of definite superiority, which continued until the end of the XVIIth century, when English influence began to grow at the expense of the Dutch, a result in large measure due to the arrogant methods employed by the latter, who thereby lost much of their influence over the Persians.

A French Company appeared on the scene in 1664, as a competitor in the trade, and established themselves at Bandar Abbas, but made little headway. In 1699, the Shah showed marked preference for the English, by visiting their factory at Ispahan and by causing arrears of customs dues to be paid them, besides granting other solid advantages. Various fluctuations of fortune attended their efforts, while the disturbed state of the country and friction between the English and the ruling Moghuls in India had an adverse effect on their prestige in the Gulf.

The year 1708, however, marked the turning point in our favour. The various companies trading with the East invited and received the official recognition of the Home Government. Troubles followed, mostly due to the unsettled state of Persia, and it became increasingly difficult to carry on the trade using Bandar Abbas as the base, so that in 1759 the English decided to move to Basra. This decision was considerably

hastened by the Seven Years' War with France, when a squadron of French ships under D'Estaing entered the Gulf and bombarded Bandar Abbas. Here they remained until 1776, when Basra was captured by the Persians. But the Persian occupation, being purely a military one, was not conducive to trade, and so the Company's activities were removed to Bushire.

Piracy.

Simultaneously with the disappearance of the Portuguese, piracy, which had been on the increase during the latter half of the XVIIIth century, became the chief means of livelihood of the inhabitants of the Oman Coast. It was, however, by no means confined to the Arabs, as there were cases of pirate ships flying English colours, who were operating both in the Gulf and the adjacent seas. Vessels of the East India Company were attacked by the Oman pirates, who, with Muscat as a base, became so strong as to give rise to the fear that they would obtain command of the Gulf. Their fleet at this time consisted of five large ships, manned by about 1,500 men.

The Muscat Arab pirates were the worst offenders, carrying out their operations as far South as Mombassa; in fact, by seizing Portuguese possessions on the East coast of Africa, they founded the present state of Zanzibar.

By 1776 this piracy was already causing such dislocation of trade that a request had to be made to the Royal Navy for its suppression. Only the year before, Captain Farmer of H.M.S. "Seahorse," on arrival at Bushire, had offered his services for convoy work, but the Company refused them. It is interesting to note that Nelson was on board this vessel, first as a seaman and subsequently as a Midshipman.

By the beginning of the XIXth century, the Arab tribes had become welded together by the influence of the Wahabis, who had come down from Central Arabia to the coast. Piratical attacks, at first confined to native craft, now became bolder, and a British vessel, the "Bassein," was captured and taken into Ras-al-Khaima, the stronghold of the Jawasmi tribe, where she was detained but subsequently released. No reparations were exacted for this insult, the policy of the Bombay Government of the day being one of non-intervention. Some time later, Jawasmi dhows made an unsuccessful attempt to capture the "Viper," an East India Company's brig, off Bushire. It is noteworthy that the Arabs, being short of ammunition, borrowed it from the "Viper," ostensibly to attack another dhow, but instead attacked the "Viper" while the crew were having breakfast. Again no action was taken by the Bombay Government, except for a demand for explanations from the Jawasmi Sheikh, to which no reply was forthcoming.

In 1803, Sultan bin Suggar succeeded to the Sheikhship of the Jawasmi, and became the leader in all their atrocities. Well aware that the hands of commanders of the Bombay Government ships were tied by their orders not to take the initiative in dealing with the pirates, the attacks on British ships became more frequent. At last, in 1806, the situation became so intolerable that the Bombay Government directed the East India Company's officers to act against these pirates, with the assistance of the Imam of Muscat.

The pirate fleet was blockaded at Kishm, and eventually forced to sue for terms of peace, and in that same year a treaty was concluded at Bandar Abbas, in which the Jawasmi Sheikh agreed to restore vessels that had been captured, and in future to respect the flag and property of the East India Company. For a brief period during 1807 they kept their word, overawed probably by the presence of British cruisers stationed in the Gulf. But in 1808, they again became aggressive, and captured no less than twenty native vessels, following this up with further attacks on British vessels. The most serious of these was the capture of the "Minerva," a merchant vessel proceeding from Bombay to Bushire, by a large fleet of pirate vessels near Quais. The entire crew, with the exception of the mate and carpenter, were slaughtered, and the ship herself taken to Ras-al-Khaima, where she was armed with some twenty guns and proceeded to cruise with the pirate fleet. There followed further captures and attacks on British vessels, only some of which were successful.

These repeated aggressions, coupled with an insolent demand that British ships should pay tribute to Ras-al-Khaima, in return for a safe conduct whilst trading in the Gulf, proved too much for the Bombay Government and for the Directors of the East India Company, who awoke to the absurdity of the order issued to their officers. They realised the time had come for drastic action, if British trade were not to be driven out of the Persian Gulf. So, in 1809, a combined naval and military expedition was despatched to Ras-al-Khaima. The town was bombarded; the Jawasmi was attacked by land and driven into the interior. The expedition dealt similarly with other Jawasmi ports on the Arabian and Persian coasts, and the bulk of the force then returned to India. The British Navy formed an important part of this expedition, and consisted of the frigate "Liverpool," of fifty guns, and two smaller vessels, the "Eden" and "Curlew," of twenty-six, and eighteen guns; other ships were cruising in the Gulf.

For a time peace reigned, but in 1814 piracy began again and increased, and it was not till 1819, when another naval and military expedition had destroyed Ras-al-Khaima and adjacent pirate refuges,

that piracy in the Gulf received its death blow. Negotiations followed this second defeat of the Jawasmi pirates, and a treaty of peace was concluded in 1820, whereupon a strong squadron of vessels was stationed off Ras-al-Khaima to enforce the treaty, and Basidu became the naval base for vessels employed in the preservation of order in the Gulf.

This peace treaty was, however, insufficient to ensure complete security at sea, because it did not deny the right of the various Sheikhs to carry on war with each other by sea. Under this pretence many acts of piracy were committed, especially during the pearling season. In 1835, therefore, the Sheikhs were induced to bind themselves by a maritime truce not to engage in hostilities by sea under any circumstances for a period of six months, on the understanding that the British Government would not interfere with their fighting each other on land. The good effects of this truce were appreciated so much by all the signatories that it was renewed the following year, and annually till 1843, when it was prolonged for a period of ten years, during which there was no serious recrudescence of piracy.

At the expiration of the ten years' truce, another treaty was entered into in 1853, known as the Treaty of Peace in perpetuity. This is in existence to-day. It was similar to the first, but with one important clause added, viz. :—that the perfect maritime truce now established for evermore should be watched over and enforced by the British Government, i.e., in the event of aggressions on any one of the parties by sea, the injured tribe should not itself retaliate but refer the matter to the British authorities for settlement. This treaty is loyally adhered to ; breaches of it are extremely rare, and mostly of a petty nature. It also cancelled the right of the Chiefs to engage in regular war against each other, implied in the 1820 treaty, and under it they agreed to refer disputes and cases of aggression to the Political Resident.

Having thus successfully dealt with piracy, and thereby made the Gulf safe for trade, the British Government turned its attention to another evil : the slave trade.

The Slave Trade.

The British campaign against the slave trade commenced in 1820 and has continued to the present day, with the result that that trade steadily diminished, and to-day is almost negligible. This result has been obtained by international agreement as regards Persia, by treaty as regards the Trucial Chiefs and the Sultan of Muscat, and by the vigilant co-operation of the British Navy, both on the African coast and in the Gulf, which resulted from time to time in the capture of many dhows and release of their cargoes of slaves.

There is, undoubtedly, a surreptitious traffic in slaves to-day, amounting, perhaps, to five hundred per annum. This is very difficult to stop, since they are conveyed in small numbers, and form part of the crews of the dhows in which they are carried.

These slaves come chiefly from Persian Baluchistan and a few from Africa, the former being landed on the Batineh coast and the latter at Sur, or other places east of Muscat. A few female slaves still come in from Georgia and Circassia, but the route by which they travel is not known, and it is not likely to be via the Gulf.

I had several instances of slaves being brought before me for manumission, either because it was their wish or else on account of ill-treatment by their owners. This latter reason is very rare, as on the whole, slaves in Arabia are well looked after; when not employed as house servants and bodyguards, they constitute the main body of pearl divers, and form the stock from which the pearl divers of the future are obtained. It is, therefore, in the direct interests of their owners that they should be given the opportunity of marrying, as well as being housed and well cared for.

Domestic slavery is, and always has been, the custom in Arabia, as well as being in strict accordance with the Koran, and we are not in a position to interfere with it, so long as there is no infringement of the liberty of British subjects. A general freeing of slaves in Arabia would be nothing short of a calamity, creating, as it undoubtedly would, an insoluable economic problem. It is quite common for a slave to rise to positions of responsibility, and one case of which I knew was the Vali or Governor of a large village on the Batineh coast. He was a full-blooded African negro—a man of considerable personality—who had been a slave all his life.

Traffic in Arms.

Britain next found herself confronted in 1880 with the traffic in arms, which was assuming dangerous proportions, and was proving a very profitable business. In spite of checks placed upon it by the Bombay Government and the prohibition of such traffic by Persia, it continued to grow. This trade was carried on by British, German and French firms. By 1897 it had assumed such dimensions that the Persian Government took effective measures to put an end to it, and entered into an agreement with the British and Muscat Governments for its suppression. Both Persian and Muscat efforts, however, were but half-hearted, and it was not until 1897 that Persia, by drastic seizures of arms, mostly at Bushire, brought the trade in that country virtually to an end. British gunboats also made considerable captures in various

places. The trade then became confined to Muscat, and was carried out mostly by French traders, British merchants being successfully prevented from so doing.

The constant flow of firearms from Muscat to the North-West frontier of India created a very serious situation for the Government of India and H.M. Government. Although the Governments of other Powers agreed to the suppression of the traffic at the Brussels Arms Conference of 1908–9, France refused to forego her existing treaty rights with Muscat, which provided for the unrestricted import and export of arms and other merchandise; this made it very difficult to suppress the traffic. After much fruitless negotiation with France, it was decided to disregard her and aim at making some local arrangement with the Sultan of Muscat for a satisfactory control of the trade. Such an arrangement was eventually come to in 1912. A bonded warehouse was established at Muscat, in which all imported arms were deposited, and issues therefrom regulated by special licenses prepared by the Superintendent and countersigned by the Sultan. The terms on which the Sultan agreed to this settlement were the payment of a lakh of rupees as compensation, plus an annual payment of a lakh of rupees in the future, and, in addition, he was to receive compensation for specific losses in 1909 and 1911.

The French refused to approve these regulations unless compensation were also made to them. H.M. Government then made it clear to the French that they were determined to support the Sultan in maintaining the regulations, which did not infringe French treaty rights, but merely regulated a dangerous trade, a right enjoyed by every Government. Eventually, in 1914, the French firms interested received compensation to the amount of £64,000, and their Government agreed not to claim for their nationals any advantages under the treaty between Muscat and France of 1884 on the subject of the traffic in arms.

These steps, together with the forceful and successful action of the British and Indian Navies, had the desired effect. Muscat took no further part in the traffic, and gun-running, to all intents and purposes, ceased.

In 1914 came the Great War, and our unquestioned predominance in the Gulf enabled us, without let or hindrance, to commence and carry through our campaign in Mesopotamia to its successful termination.

Policing the Gulf.

Coming to modern times it would be well to consider some of the obligations we have undertaken with regard to the peoples of the Gulf

and what we demand from them in return, in order that the position existing there to-day may be clearly understood.

Apart from Iraq the States or peoples thus affected are Muscat, Sheikhdoms on the Trucial coast, El Katr, Bahrein and Koweit. These undertake not to cede, sell or mortgage any of their territory except to the British Government, or to give an oil concession, without its permission. They agree to prohibition of the traffic in arms and the suppression of the slave trade in their territories. With the exception of Muscat, they all undertake to have no negotiations with, or to receive the representative of any Power other than the British Government, except with its consent, and also undertake not to give any pearling or sponge fishing concession without permission. They also undertake to maintain peace in perpetuity with the British Government.

We, on our part, promise to all, protection from aggression by sea; to Koweit, unqualified protection; and to El Katr we promise our "good offices" in the event of aggression by land. These undertakings are, in fact, a part of the Trucial Treaties already mentioned.

Although we have at present no treaty obligation to protect Iraq at sea, our present relations with that country require that we should undertake this duty.

So it can be truly said that Great Britain has constituted herself the "policeman" of the Gulf, not only in her own interest, but in that of all who reside in its littoral, and any whose trade interests take them there. The work of policing the Gulf is carried out by an armed yacht and three sloops: a squadron whose duties in peace time can be set down as being:—

(*a*) Enforcement generally of the Trucial Treaties, which includes suppression of the arms traffic and slave trade.

(*b*) Protection of British interests and of those of British subjects in the Gulf.

(*c*) Protection of our oil supply from Persia.

(*d*) Questions dealing with the air route to India.

British policy in the Gulf is directed by the Government of India, Foreign Office and Colonial Office through the Political Resident, who resides at Bushire, with Political Agents at Kuwait, Bahrein, Muscat and Bandar Abbas (where he is also the Consul), and on the Trucial coast by a native, who is termed the Residency Agent, residing at Sharja.

With all these the Senior Naval Officer keeps in close touch, and there is a constant interchange of intelligence between him and the political authorities. In fact, he and his squadron provide the motive force which enables the policy of the day to be carried out, trade to

go on uninterruptedly, and law and order to be preserved. This entails a ceaseless vigil, visiting ports, investigating rumours of gun-running and slave trading (which necessitates constant boarding and inspection of dhows), complaints of British subjects residing on the Arabian littoral, keeping the peace amongst the pearling fleets, prevention of poaching or piracy on the pearl banks, settling disputes between Arab Sheikhs, who are always burning for a scrap with each other, and obtaining redress for insults to the British Government or its representatives. These are not the only calls on the time of our ships; during the season for gathering dates on the banks of the Shatt-al-Arab, thousands of Arabs and also natives of India congregate for picking and packing, and the knowledge that a British gunboat is in the river has a salutary effect. Protection may also be required by the Anglo-Persian Oil Company at Abadan. In addition, ships have to carry out their usual firing practices and training exercises.

The summer is by far the most active period of the year, because the majority of the Arab tribes from Ras-al-Hadd to Kuwait make their livelihood out of the pearl diving, fishing and trading with the Persian coast on the opposite shores. For all these the weather from March to October is the most suitable, as later on the water becomes too cold for diving, and strong gales are of frequent occurrence.

The pearl fishing season, which commences in a small way in May, reaches its height by July and finishes towards the end of September, when the fleets of dhows return to their harbours to lay up for the winter. The date harvest on the Shatt-al-Arab is in full swing by August, and lasts some two months: the hottest and most unpleasant time of year in Iraq.

The Arab does not often venture far from land in the winter, unless the enterprise on which he is bent is really worth the risk, such as the smuggling of tea and sugar into Persia, which is extremely lucrative, or gun-running, for which purposes the winter is more suitable, owing to the longer nights. The busiest time for our ships, therefore, is one when, according to official records, the *mean* temperature may vary between 82°F. for May and October and 97°F. during July and August, with a humidity as high as 90 per cent. The actual temperature in the Gulf during July and August, the hottest months of the year, ranges between 90° and 100°F., whilst at times the humidity of the atmosphere is so great that it is common for the wet and dry bulbs to be within a few degrees of one another.

Although clothed as scantily as possible, in shorts, a shirt, stockings and shoes, one lives in a continual bath of perspiration day and night for several months. Even with the setting of the sun, there is little

relief; in fact the humidity increases, and one wakes from an unsatisfactory sleep wet through. These trying conditions, combined with the resultant ills, such as prickly heat, from which few escape, and boils—although inoculation has done much to mitigate these—as well as fevers peculiar to the Gulf, have a very lowering effect on the health of the personnel. At Bahrein in August, 1926, out of my total white complement of eighty-eight officers and men, over forty were on the sick list at the same time, suffering from these ailments.

The temperature of the sea heats up to well over 90°F., with the result that there is no cooling effect on the hull of the ship. Cold water for baths is only obtainable by leaving water standing, as that drawn from the tanks is always hot. Any work by others than natives in the sun is out of the question. As an example of this, two of my officers landed on Farsi Island for surveying; they returned to the ship at 9.0 a.m., after being ashore for barely half-an-hour, unable to continue their work, despite helmets with wet towels over them. On one occasion, H.M.S. "Crocus" had a temperature of 161°F. in the stokehold, steaming seven knots with one boiler.

This brief description of the climate gives some idea of the arduous nature of life on board ship in the Gulf during nearly six months of the year. It is mitigated in modern times to some extent by the existence of ice-making machines and fans, but in spite of these the summer is a very trying time.

Personal Experiences.

Some personal experiences which fell to my lot during the years 1926 to 1928, will give an idea of the multifarious duties of the Senior Naval Officer.

My first impression: that I was in for a dull time on a very unpleasant station, was soon dispelled. It did not take long to discover that the work ahead was to be full of interest and the station a most engrossing one, despite the climate.

Early in June, 1926, the Political Resident asked me to visit the Trucial coast and endeavour to obtain the surrender of an Arab who had, for several years, been causing a lot of unrest, and who was believed to have been at the back of an attempt on the life of our Residency Agent at Sharja. In the interests of peace, the Indian Government had considered it advisable that he should be removed from the country, and he had been sentenced to undergo a period of four years' exile at Aden.

Some time before this, the Sheikh of Sharja had been deposed by a *coup d'état*, organized by this particular Arab, Abdul Rahman, and his

nephew, Sultan bin Suggar, a young man of turbulent character, put in his place. This change of rulers was approved of by the Indian Government, provided that compensation was paid by him to the deposed Sheikh, and the latter's property in Sharja respected. This he promised to do, but failed to carry out, and it was during the negotiations on this subject between the Residency Agent and the Sheikh that the attempt on the life of the Residency Agent was made. The Agent escaped injury, but his cousin, standing alongside him was shot dead. The actual culprit could never be discovered, though it was evident that Abdur Rahman was implicated, and pending further action the Sheikh of Ras-al-Khaima undertook to be responsible for his actions, and to that town he was removed. It was not until long afterwards that I learnt that the Arab charged with the mission had waded out into the creek, rifle in hand, and after firing the shot dropped the rifle into the creek and calmly waded ashore.

This incident, besides being murder, constituted an insult to the Indian Government, and, therefore, could not be allowed to rest. Judicial enquiries having failed, it was decided to take the action I have already referred to, as well as to enforce the payment of blood money by the Sheikh of Sharja, and a fine of some thousands of rupees for the insult to the Government. On arrival at Ras-al-Khaima, I demanded Abdur Rahman's surrender, which was promptly refused by the Sheikh, who said he was afraid of possible hostile action on the part of the Bedouin who were friendly to Abdur Rahman, if he were given up. The real reason being, I felt sure, he was afraid of incurring the emnity of the Sheikh of Sharja if he did so. Ras-al-Khaima remaining obdurate, I proceeded up the coast to Dibai, and with the Sheikh of that place and his brother, returned to Ras-al-Khaima. At a medjliss, held on board the " Triad," I explained that it was in the best interests of peace on the Trucial coast that this " stormy petrel " should be deported for a time, and that if the demands of the Indian Government were not complied with, serious consequences would undoubtedly ensue. Negotiations continued from day to day for about a week, when the Sheikh of Dibai—seeing that my patience was coming to an end—had the good sense to persuade Ras-al-Khaima to give in. Abdur Rahman surrendered to me the following morning, whereupon I arranged for his passage to Aden.

The " consequences " which I had in mind were first to prevent by force any dhow from either Ras-al-Khaima or Sharja proceeding to the pearl banks, and secondly, if this did not have the desired effect, to knock down one or two of the look-out towers by gun fire. The latter is usually most effective, as the demolition of these towers lays the

particular town open to attack by the predatory Bedouin of the interior, who are not slow to take advantage of another's misfortune. I was glad, on this occasion, that I had not to resort to either one or the other.

We then moved on to Sharja, summoned the Sheikh on board, and informed him that he would be held personally responsible in the future for any harm that might happen to either the British Residency's Agent or any other British subject in the place, that threats against his life must cease, and a loop-holed tower, which commanded the roof of the Residency Agent's house, be removed. Also the fine imposed by the Indian Government and the blood money due to the Residency Agent must be paid within a specified time, at the latter's residence. I gave him until the following morning to comply with both demands, warning him that if he did not remove the tower I would demolish it by gun-fire without fail. Further, I warned him that on his future behaviour depended whether he would not be deposed and his predecessor reinstated.

The tower came down during the night, and I walked over its ruins on my way to receive the indemnity the following morning; this amounted to some £500 altogether, of which 800 rupees was blood money. £400 was paid in King George V sovereigns, and the remainder in rupee notes and Maria Theresa dollars.

At the end of a very hot July the same year, I was at Bushire for a conference with the Political Resident on general questions, when a W/T message came through from the Political Agent at Bahrein, saying that there had been trouble in the Sheikh's Levy Corps. A sepoy had run amok, killed two of his native officers and wounded the Agent. The Resident asked me to render any help that might be required. I at once ordered the " Cyclamen " to Bahrein, and having filled up with coal from dhows off Bushire—a very tedious and unpleasant business in such hot weather—I joined her at Bahrein.

The Political Agent had at the time taken over the command of the Levy Corps while the Officer Commanding was on leave. He was sitting at a desk in the Levy Corps' office, hearing a report from the Subadar, when a sepoy, hiding behind a table at the end of the room, fired at the Subadar; the bullet, after passing through the latter, grazed the Political Agent's ear. Two more shots followed in quick succession. Not knowing where the attack had come from, the Political Agent, who was in an alcove, tried to spot the offender, when he was bayoneted in the back by the sepoy from outside the window. Although quite unarmed, he rushed to the door to disarm his attacker, but in the attempt he was wounded in the forearm, twisted his foot and fell to the ground. While there, the sepoy stabbed the Agent several times with his bayonet, but being by now rather scared, he did not put much force

into the effort, and then ran away to another part of the fort, where he was subsequently taken into custody by civilian prisoners, the whole of the Levy Corps having gone to ground at the sound of the shots.

As a result of this incident the townspeople were in a very jumpy state, fearing, I suppose, the probability of the Levy Corps, now without officers, helping themselves to the rifles and ammunition in the fort and perhaps looting the town. The prompt arrival of the " Cyclamen " may have prevented this ; but, anyway, I thought it advisable to land an armed party. I then entered the fort, made prisoners of everyone inside, including the murderer, and removed all arms and ammunition.

The murderer and a Mullah, who was an object of suspicion, were put on board ship, the former to await trail, and the latter to have his share in the affair investigated. As reports were continually being received of suspicious characters lurking about the town, and as the police were only native volunteers, owing to the Levy Corps, who usually supplied them, being all prisoners, a small naval guard was put into the Political Agent's house, and a larger one—with a machine gun—to keep the prisoners in the fort from any mischief. This state of affairs continued till after the trial. The murderer was sentenced to death, and shot by a firing party from a regular Indian Regiment, a company of which had been sent to take the place of the Levy Corps, who had meanwhile been disbanded and deported. Nothing could be brought home definitely against the Mullah, who was accordingly released and deported. This brought the affair to a satisfactory ending.

Subsequently a fresh Levy Corps recruited from Reservists from India took the place of the Regulars, and there was no recurrence of any such trouble.

Political Situation and Alternative Naval Bases.[1]

The present political situation in the Gulf can only be described as nebulous. Many outstanding questions between Persia and ourselves are now under discussion, but the two most important are : (*a*) the status of Basidu and Hanjam and the ownership of the other Gulf Islands, and (*b*) the Persian claim to Bahrein. On the settlement of these largely depends the future position of our naval base in the Gulf.

The small territory of Basidu forms the Western part of the island of Kishm. This island had been leased by Persia to the Imam of Muscat early in the XIXth century. In the year 1822, when engaged in the suppression of piracy, we, with the consent of the Imam, first occupied

[1] The term " Naval Base," as used in this Lecture, is to be understood as merely referring to a port which provides facilities for recreation, storage, communication, etc.

Kishm, and subsequently moved to Basidu, using it as a naval and military base in our operations against the pirates. At the time, Persia protested strongly against this occupation, and, consequently, in February of that year, we withdrew. As however, there still remained doubts as to the rightful ownership of the island, and no equally convenient base could be found elsewhere, Basidu was again occupied in 1823, without further protest by Persia, until recently when, in 1926, Persia once more raised the question.

Although the undisturbed occupation of this small territory for over one hundred years may not entitle us to Sovereign rights, it should go far to justifying our continued occupancy on the original terms.

In 1904 the base was moved to the Persian Island of Hanjam,[1] and located within the telegraph concession which had been granted to us by Persia in 1868. This was found to be a more convenient position in every respect: a better climate, more spacious and safer anchorage, a good water supply, good communication with India, better facilities for recreation, as well as occupying as it does a valuable strategic position at the entrance to the Gulf. Subsequently we erected a wireless station, coaling base and store houses, and created recreational facilities; all these were necessary in connection with the suppression of the arms traffic, in which Persia was, at the time, also interested.

It would be of great advantage if our position on the island could be regularised, for two reasons:—

(1) The strategic importance of having a fuelling station at the entrance to the Gulf is great.

(2) It is one of the only places which offer recreational facilities for the men of the Squadron—a most important factor, when one considers that, with the exception of Muscat and Basra, no leave can be granted anywhere else.

Of the two places, Hanjam and Basidu, the former is the most suited to the requirements of a naval base. Possibly, therefore, we might surrender our position at Basidu in exchange for a regularization of our present position at Hanjam.

Failing such an arrangement, or the obtaining in other ways of a concession from Persia for the continued use of the telegraph concession of Hanjam, it will be necessary to look elsewhere. In doing so, one naturally turns first to Bahrein, on account of its being under British protection. This island offers facilities for establishing a naval base suitable for vessels of light draught, but the roadstead to the North, in its present state, is too exposed, and holding ground is bad, so that

[1] It is a port of call for the British India Gulf Line Steamers.

ships must anchor a long way out owing to shallow water, and communication with the shore is often impossible owing to the strong shamals. To convert this open roadstead into a harbour would involve much blasting of coral, dredging, and the building of a breakwater, all exceedingly expensive operations.

On the South-East side of the island lies the harbour of Khor Khaliya, enclosed on the East by reefs. It is approached through a channel some two cables wide at its Southern end. Inside, the middle part is occupied by a large sand bank with a depth of water of from 7 to 16 feet, but there is considerable space all round it with depths of from 18 to 45 feet, suitable for small vessels. This harbour affords good shelter, and although the entrance channel would require blasting and dredging to a considerable extent, the cost would appear likely to be much less than conversion of the Northern roadstead. The climate is extremely damp and unhealthy, which is a serious drawback, and for this reason alone it is doubtful if Bahrein could be used as a base for the Persian Gulf Squadron.

Here, too, we find Persia constantly asserting her claims, while we have, so far, as constantly repudiated them. In the case of Bahrein, these claims are of the flimsiest nature, being based on an alleged recognition of Persian Sovereignty by our Secretary of State for Foreign Affairs in the year 1869. It is true that the island was occupied by the Persians long ago, but in 1783 they were driven out by the Utub Arabs from Arabia, whose descendants to-day form the most influential of its people, and as neither they nor their Sheikh desire to come under Persian rule, I think we have a very strong case for remaining there.

None of the other islands are in any way suitable for naval purposes, since none possess harbours, also their nationality is at present indeterminate, Persia and the Arab Sheikhs of the Trucial coast being rival claimants to them. The only other part of the Gulf possessing harbours is the Mussandam Peninsula,where good land-locked bays and fiords are plentiful, but all must be ruled out owing to the excessive summer heat, which drives even the hardy inhabitants to the hill-tops and date groves.

The Persian Air Route.

By an agreement reached in June, 1928, Persia consented to a limited service operating for a period of three years, from January, 1929, using only Bushire and Jaskh as aerodromes and Lingeh as an emergency landing ground, but it was stated that this permission will not be renewed.

The Arabian Air Route.

This route has been reconnoitred by the Royal Air Force, assisted by the Royal Navy. Landing grounds and petrol dumps are to be established at Shaibah, Kuwait, Bahrein, Abu Dhabi, Sohar, Yas Isld, and some points on the Hasa coast, and negotiations to this end with the tribes concerned are now proceeding. A great deal of opposition is being encountered on the Trucial coast, the Sheikhs of Abu Dhabi and Ras-al-Khaima being bitterly opposed to any encroachment on their territory, whilst of the remainder only one, Hamrya : one of the least important Sheikhs, regards the proposal favourably, and would offer facilities in return for an annual payment.

I feel that there are many difficulties to be overcome before this route can be established, the chief of which is the hostility of the Arab Sheikhs, who have a horror of all forms of European penetration. It also has another disadvantage in that it is longer, and involves crossing the sea for 226 miles from Sohar to Karachi.

Future Commitments.

There is one question which I am sure must be in the minds of many : why do we, and must we, remain in the Gulf ? The first reason is that the Gulf forms an important link in the chain of our communications with the East. Our trade with Persia, Iraq and Arabia is considerable, amounting as it did in 1927, to some £18,000,000, and with the completion of the railway from Khor Musa to Teheran and the further opening up of Iraq by the possibility of a railway from Bagdad to the Mediterranean, it will further tend to increase. Then there is our oil supply. This constitutes a most important source of fuel for the Empire, both East and West ; in time of war it might be our only source, if for any reason American supplies were cut off. I refer here not only to the Anglo-Persian Company's Oilfields, but to the untapped resources of Iraq, in which we have a large interest.

Again, there is the air route to India, which is becoming more important every day as progress in aircraft develops.

But these are not the only reasons. We went to the Gulf in quest of trade and we found it ; but in so doing we have created obligations which in honour bound we must continue to meet, and these I cannot express better than by quoting two pronouncements by the late Lord Curzon, which apply as much to-day as when he made them. The first is from a speech delivered by him to the Trucial Chiefs in 1903, when he said :—" Sometimes I think that the record of the past is in danger of being forgotten, and there are persons who ask why should Great Britain continue to exercise these powers. The history of your States

and of your families, and the present condition of the Gulf, are the answer. We were here before any other Power, in modern times, had shown its face in these waters. We found strife and we have created order. It was our commerce as well as your security that was threatened and called for protection. At every port along these coasts the subjects of the King of England still reside and trade. The great Empire of India, which it is our duty to defend, lies almost at your gates. We saved you from extinction at the hands of your neighbours. We opened these seas to the ships of all nations, and enabled their flags to fly in peace. We have not seized or held your territory. We have not destroyed your independence, but have preserved it. We are not now going to throw away this century of costly and triumphant enterprise; we shall not wipe out the most unselfish page in history. The peace of these waters must still be maintained; your independence will continue to be upheld; and the influence of the British Government must remain supreme."

Later, when speaking on the Persian question, Lord Curzon said:—"I have shown the Persian Government along its Northern shores exercising a more vigorous and undisputed sovereignty than at any period since the reign of Shah Abbas; and small Arab States, retaining either wholly or only in part their original independence; while between all parties intervenes the sworded figure of Great Britain, with firm and just hand, holding the scales. It is no exaggeration to say that the lives and properties of hundreds of thousands of human beings are secured by this British Protectorate of the Persian Gulf, and that were it either withdrawn or destroyed both sea and shores would relapse into the anarchical chaos from which they have so laboriously been reclaimed."

DISCUSSION.

CAPTAIN SIR EDWARD HEADLAM (late Royal Indian Marine), speaking from thirty-five years' experience of the East, wished to state how much struck he had been at the light-hearted manner in which the Lecturer spoke of the hardships which white crews are called upon to undergo in the Persian Gulf, owing to the intense Summer heat.

There were also, he knew from personal experience of the Gulf, great difficulties in the way of carrying out the duties of Senior Naval Officer successfully. This Officer has to serve his own masters at the Admiralty; he has, to a certain extent, to serve the Government of India; he has to serve the Foreign Office; while he has to work in close and amicable contact with the Political Residents of the Persian Gulf. These are all apt to be difficult tasks if taken in combination. It spoke highly for the judgment of those who had filled that appointment that their duties should have been consistently well carried out. He could speak from personal experience as late Director of the Royal Indian Marine how well the Senior Naval Officers on the Persian Gulf had done their work.

THE CHAIRMAN:

The Chairman said " As an example of what is being done in the Gulf at the present time, and how far we are carrying out our side of the Treaty, I may recall to you that under two years ago there was trouble at Koweit, and the Sheikh begged for our help. For over five weeks we had 240 men on shore manning the walls of the town, and thereby prevented it from being attacked by the Arabs. Again, there was trouble lately at Sur. Thereupon it was eventually decided to demolish a fort, so as to impress the inhabitants, who were warned of our intention. I ordered the "Cyclamen" to carry out the job with her 4-inch guns. We then had the Sheikh on board, and I said to him " You saw those small guns knock the fort down, and you have seen what they can do. If you don't behave, you will see what our big guns can do." Since then there has been peace there.

With regard to British Basidu, it is little more than a stretch of sand, but we have had a guard ashore there for eighteen months to ensure that our flag is not hauled down. One ship landed thirty-nine men there, and thirty-eight of them went down with malaria, showing that it is not a very pleasant or healthy spot. The Senior Naval Officer in the Gulf, Captain Boyes, in writing to me lately, said in the course of the letter, " Letter-writing is not easy, as the temperature in my cabin is 125°. We are coaling ship, and there is a sandstorm on."

Nevertheless, there is a better side to service in the Gulf. The hot weather does not last all the year round. There are six months of pleasant weather in the Gulf; in fact it is the only station in which my Flagship wore blue clothing in the East. Also there is a golf course of eighteen holes; though it is true that those eighteen holes are all there is on that course. However, it is a source of great amusement.

Another advantage of the Gulf is that money is saved by being stationed there, since there is no opportunity to spend it. At Abadan, where the Anglo-Persian Oil Company works, there are charming quarters, ball rooms and concert rooms. These the Anglo-Persian people put at the disposal of the Navy in the most hospitable way."

ADMIRAL SIR DRURY WAKE, speaking from personal experience, thought that the only solution he could offer to Captain Headlam's remarks concerning the difficulty of the Senior Naval Officer's position was to make him a Commodore, a rank which would carry more weight.

He did not altogether agree with the Chairman as to there being six months of comparatively cold weather there. He spent the whole of his service on the Gulf in whites and shorts.

The customary votes of thanks to the Lecturer and the Chairman, which were carried by acclamation, brought the proceedings to a close.

THE FLEET FIGHTER

By Lieutenant R. H. Barrett, R.N.

AIR operations forming the accompaniment to a fleet action will, if the fullest co-operation between aircraft and ships is to be obtained, have to conform as nearly as possible to the policy of a continuous offensive against the enemy and his resources. In practice, however, the number of aircraft employed and the time during which they can be effective will both be limited by action conditions; moreover, the fleet's resources in aircraft will be dependent mainly on the number and size of the accompanying aircraft carriers. Freedom of movement for attacking aircraft and reconnaissance aircraft will, therefore, be all-important, and will depend on the degree of air superiority established in the initial stages of the operations. It will be equally important during later stages, and would be materially assisted by the destruction of the enemy carriers.

It is apparent that air superiority is to be the dominating factor throughout the air operations of an action. The fleet that fails to obtain it stands to lose the value of air co-operation as well as such losses as may be inflicted by air attack, and, if either are of such importance that defeat may be the result, it becomes an equally dominating factor in the issues of a battle at sea.

Let us now consider the means by which air superiority may be established. In doing so, it is not proposed to consider all these means in detail, with the one exception of the type of aircraft to be employed.

But, broadly, attainment of air superiority is dependent on the destruction of enemy aircraft, whether in the air or in the enemy carriers. To this end, the following methods may be employed :—

(*a*) Anti-aircraft fire from surface ships.

(*b*) Destruction or disablement of the enemy carriers by bombing or torpedo attacks from the air, or by gunfire or torpedo attack from surface ships.

(*c*) Fighter aircraft.

Anti-aircraft fire may be discounted at present, owing to its undeveloped state, but it might, in the future, be a factor to be reckoned with.

Destruction of the enemy carriers, if effected before any aircraft had been flown off, would be decisive, but it is unlikely that this could be achieved. If the majority of the aircraft had been flown off, destruction of the carrier would have no immediate effect, although the results would commence to appear shortly afterwards. In the latter case, too, the carrier could only be destroyed if sufficient air superiority had been attained to allow the attacking aircraft to reach their objective; so we are still in need of some means of attaining this initial superiority. This can only be supplied by the use of fighter aircraft.

It is possible that the use of fighters may be even more effective in this form of air warfare than in others. The absence of real resources, and the conditions obtaining in a fleet action, make the balance of air power very critical, and the more likely to be swayed by a direct blow, such as the timely launching of a superior concentration of fighters with the destruction of enemy aircraft as their main objective.

If fighters are to be selected as the primary factor in establishing air superiority, then it is important that they should be the best possible type, taking the conditions under which they will have to work into consideration.

Up to date, little experience of fighter work has been gained in the fleet, except in peace-time exercises, and in these only one type has been employed; this is the single-seater fighter which has, unfortunately, numerous limitations which preclude it from functioning with complete efficiency. The only other type available at the present time is the two-seater fighter. This aircraft has not been extensively used in air operations at sea, but it proved itself of considerable value in France during the war, both as a fighter and as a short reconnaissance machine.

In order to establish the functions that each type is capable of performing, it is proposed to set down their respective advantages and disadvantages, from the point of view of fleet requirements:—

The Single-Seater Fighter.

Owing to the relatively small load to be carried, this type can be built to be faster, have a better climb, and a higher degree of manœuvrability than any other aircraft. The armament consists of two fixed machine guns and a small load of bombs. Its advantages are:—

(1) It can outclimb and outmanœuvre an opponent, and so get into a position from which it can fire without being fired at in return.

(2) It lends itself very readily to surprise tactics: an important factor in air combat.

Its disadvantages are:—

(1) The necessity for a high performance limits the fuel capacity and gives it only a short endurance. The only means of increasing the latter would be to attach extra fuel tanks to the fuselage or main planes, but this would reduce the manœuvrability, and should it become necessary to fight before the fuel in these tanks had been expended, they would have to be detached. This would be very unsatisfactory from the point of view of operations, since the full endurance could never be relied upon.

(2) The fixed armament compels the pilot to take the offensive under all conditions. If he is attacked he cannot defend himself except by turning and attacking in his turn. If he is attacked from astern—where a sharp look out cannot always be maintained—he is liable to be surprised and shot down before he can take any steps to counter it.

(3) The fixed armament also makes it impossible for a formation of single-seaters to concentrate their fire on a single target without danger of collision.

(4) At sea, accurate navigation is essential to all aircraft, since they are constantly employed out of sight of land and of their own fleet. Single-seater formations would, therefore, have to be accompanied by a multi-seater to navigate them to and from their objectives. This would be a most unsatisfactory procedure for the following reasons:—

(*a*) The difference in performance between the two types would rob the fighters of their main advantage.

(*b*) The formation leader would be handicapped in his judgment through having to keep in company with the navigating aircraft.

(*c*) The success of the operation would depend entirely on the reliability of one machine.

(5) An offensive, carried out by fighters against enemy aircraft at any distance from a base or carrier, demands the ability to retire fighting a rearguard action. The fixed armament of the single-seaters makes this impossible.

(6) Single-seaters rely, to some extent, on superior numbers to achieve success. This is a disadvantage in a fleet where aircraft accommodation is limited and where no replacements for casualties are available, as it would tend to overcrowd the carriers with one type at the expense of other types.

To sum up: the single-seater relies on superior performance, surprise, and numerical superiority. If these factors are in its favour it should be of value within its range. Beyond this, its lack of navigational facilities and its inability to retire without support make it valueless. It is essentially a short range type.

The Two-Seater Fighter.

The performance of this aircraft is generally inferior to that of a single-seater in respect of speed, climb and manœuvrability, but still superior to all other types. The armament, in this case, consists of two machine guns, one fixed as in a single-seater, the other mounted on a movable mounting in the rear cockpit and operated by the passenger. Front and rear guns can be used offensively while the rear can be used in defence.

The following are the main advantages, as compared with the single-seater:—

(1) It has a longer endurance, the rear gun allowing manoeuvrability to be sacrificed to extra fuel capacity.

(2) Navigation can be undertaken by the passenger.

(3) A formation of this type can fire their rear guns without danger of collision. This allows them to concentrate a powerful fire on a target.

(4) A formation can retire and fight a rearguard action without breaking formation, by using their rear guns.

(5) Wireless apparatus can be carried. This allows a short reconnaissance to be carried out, which would be specially useful when opposition from enemy aircraft was expected, since this machine is fully capable of defending itself.

Briefly, this type is a complete fighting and reconnaissance unit in itself. It can operate offensively and defensively at any distance from its base or carrier within its range, while its ability to communicate by wireless increases its value. Its only disadvantage is that it lacks the performance of the single-seater; it has, on the other hand, none of the single-seater's disadvantages in fleet requirements.

Short and Long Range Work.

The problem of a long-distance fighter is thus partially solved, for the two-seater should be capable of fighting well outside the range of the single-seater, and this makes it possible to divide up the duties of fleet fighters under two heads:—

(1) *Short range work*, to include:—

- (*a*) Offensive patrol over carriers and other important fleet units.
- (*b*) Interception of enemy aircraft approaching the fleet.
- (*c*) Machine gun and low bombing attacks on exposed positions in warships.

(*d*) Machine gun and low bombing attacks on ground targets in support of an opposed landing in hostile territory.

The single-seater is particularly suited for these functions, where its high speed and manœuvrability make it a difficult target for ship or ground fire, and where its aptitude for surprise tactics may enable it to break up an enemy formation before they reach their objective. The moral effect of machine gun attacks from the air is very great.

(2) *Long range work*, to include :—

(*a*) Offensive patrol over the enemy fleet during the period of approach ;

(*b*) Other distant offensives where the support of other aircraft is not available ;

and if wireless telegraphy is carried :—

(*c*) Reconnaissance over defended areas where opposition from enemy aircraft may be expected ;

(*d*) Short reconnaissance duties.

In these duties the two-seater would be the only type to employ. Its fighting efficiency and ability to navigate and use wireless telegraphy make it capable of independent action, while a formation of this type has very formidable defensive powers.

Both single-seaters and two-seaters have limitations in respect of armament and endurance, but until a fast multi-seater fighter, armed with a heavy long range armament, is produced, these two types only will be available.

Meanwhile, the proof of the soundness of the policy that introduces the two-seater type will be obvious, even in peace. It is a general utility aircraft with a high performance, and cannot but find a wide range for useful work. In war, in addition to its duties in the fleet, it would be of great value to detached units, where a short reconnaissance might prove invaluable.

In conclusion, it would appear that the problem of establishing air superiority is not a function that can be undertaken by one type alone. The conditions peculiar to a fleet action demand primarily a highly mobile and self-contained fighter, that can "carry the war into the enemy's country," and for this the two-seater is the nearest approach to the ideal type. On the other hand, the single-seater has some strategically defensive functions, for which it is far more suitable than the two-seater. A combination of both, each in its own sphere, is essential if air superiority is to be firmly established beyond the power of the enemy to disturb it while the action is in progress.

A SINGLE SEATER

A TWO SEATER

NEW FAIREY FIGHTERS

(Photographs by courtesy of the Fairey Aviation Company

By courtesy of H.M. Consul at Barcelona.

THE SIEGE OF BARCELONA

From an old Print

From an old Print

THE CAPTURE OF BARCELONA, 1705

A LITTLE KNOWN COMBINED OPERATION

By Captain H. FitzM. Stacke, M.C., *p.s.c.*,
The Worcestershire Regiment.

THE capture of Barcelona is almost unknown to the British public and even to the majority of the British Army. Doubtless this is due to the fact that the campaign in Spain of 1705–10, being generally unsuccessful, has never been much studied in this country, whilst it has been completely overshadowed by the more glorious achievements of the Duke of Marlborough. But this general ignorance of a remarkable exploit may also be attributed in part to the fact that it has never been commemorated by a battle-honour on the Colours of the Regiments engaged. Among many curious oversights in our authorized roll of battle-honours this omission of the capture of Barcelona is, perhaps, the most regrettable. Alike from the hazard of the operation, the sharpness of the fighting, and the general importance of the event in European history, " Barcelona 1705 " is, in truth, more worthy to be borne as a battle-honour than many of the engagements whose names are now displayed on the Colours of British Regiments.[1]

During 1929, a great International Exhibition was held at Barcelona. For that Exhibition long avenues of palatial buildings were constructed over the open ground South of the city on the slopes of the hill of Montjuich which, crowned by the castle of that name, dominates the harbour from its southern side. How many, if any, of the British visitors, as they strolled along the slopes beneath that castle, realized that once, long ago, young British soldiers, tired from an all-night march but fired by the thrill of their first battle, charged shouting up those very slopes to storm that fortress, and that on the low ground at the northern foot of Montjuich British seamen hauled and worked their cannon to batter down the city walls ? Unfortunately, there was nothing to recall these associations. The official programme of the exhibition, in a brief summary of the city's history, merely states that in 1705 an " Austrian "

[1] See two articles on " Battle Honours and their Anomalies " in the R.U.S.I. Journal for November, 1921, and February, 1922.

army took the city; no word of any British force, and this capture is only one of many chronicled in the city's chequered career. Nor has the British public been helped to remember that noteworthy feat by any word in our own Press.[1]

The War of the Spanish Succession had resulted from the death, in November, 1700, of King Charles II of Spain. That monarch left no direct descendant, and the hereditary succession was bound to pass into foreign hands, since his sister had married King Louis XIV of France, and his aunt had married the Austrian Emperor Leopold. Both sovereigns had formally renounced their claim to the Spanish dominions, but both now pressed the claims of their younger sons to the vacant throne. The King's will left the succession to the French candidate, Philippe, Duc d'Anjou; but the late King had been of feeble mind, and the addition of the whole Spanish Empire to the already great power of France was more than the rest of Europe could tolerate. For a time futile negotiations were carried on for a partition of the Spanish Empire. In the meantime, Philip of Anjou had proceeded to Madrid and was accepted as King by most of the leaders of opinion; but Spanish politics, then as now, were tangled and unstable, while a strong minority, particularly in the turbulent province of Catalonia, supported the claims of the Austrian candidate, the Hapsburg Archduke Charles. In his favour Austria, Holland and Great Britain leagued themselves by treaty to oppose the union of Spain with France. A delicate situation was then brought to a head by the action of the French King in proclaiming Prince James Edward Stuart—"The Old Pretender"—as King of England, when his father, the exiled James II, died at St. Germain in September, 1701. That affront definitely roused English public opinion against France. Active preparations were made, and in May, 1702, war was declared.

The main theatre of operations was on the Eastern boundaries of France, where the British and Dutch forces, under the Duke of Marlborough, were to win the great victories of Blenheim, Ramillies, Oudenarde and Malplaquet during the next ten years. But presently the efforts of the Allies in that theatre of war were supplemented by the despatch of other forces to Spain itself, in the hope of assisting the partisans of the Archduke Charles.

The first expedition to Spain was in August, 1702, when an Allied force of 14,000 troops in a large convoy of transports, escorted by a

[1] To the best of our knowledge not a single article on that victory has been printed during the past year in any newspaper or magazine in this country. Brigadier-General Ballard's life of the Earl of Peterborough has alone come to remind our countrymen of a campaign which is, perhaps, one of the most romantic in the long catalogue of our expeditions overseas.

British and Dutch battle fleet of fifty ships, sailed from England for Cadiz. The leadership was not brilliant, and the attack on Cadiz met with no success. But on the way back the expedition had the luck to discover, in Vigo Bay, a Spanish treasure-fleet home from the Indies. That fleet was destroyed with great loss to Spain and much booty for the Allies. It may be doubted if that exploit enhanced the popularity of the Austrian cause in Spain, but in England the returning expedition became popular heroes.

Next year, Portugal, terrified of conquest by the united power of Spain and France, revived her ancient treaty with England and openly joined the Allies. This gave a definite base for the conduct of operations in the Peninsula, so the prospects of the Archduke Charles seemed brighter. It was decided that the young Austrian prince should enter Spain with Allied backing, and should fight for his throne. He journeyed from Vienna to England, where, after a short visit to Queen Anne at Windsor, he sailed from Portsmouth in February, 1704, accompanied by an Allied expeditionary force of British and Dutch troops.

The expedition was intended to operate from Lisbon in alliance with the Portuguese, but a short acquaintance with the Portuguese ministers and army discouraged the allied leaders. After some months spent in futile discussions, some of the troops were re-embarked in a British squadron under Admiral Sir George Rooke, who then cruised along the Spanish Mediterranean coast until attracted by the idea of seizing Gibraltar as a base. Capturing the Rock—then only a minor fortress—by a surprise attack, he furnished it with a garrison which later withstood a prolonged siege. Then he fought a desperate but indecisive naval battle at Malaga. Like Jutland, that battle was claimed by both sides as a victory, but, also like Jutland, after the battle the enemy's fleet retired into its harbours and left the British fleet in effective control of the sea.

The confidence of the Allies, now raised by these successes, was further stimulated by news of Marlborough's great victory at Blenheim. It was decided to strengthen the forces with the Archduke, and a fresh expedition was despatched from England under command of the Earl of Peterborough.

That selection of a commander would seem odd nowadays, for the Earl had but little previous military training and no experience of high command. But in that epoch high social position was more important than military rank, especially when dealing with Allies of royal blood and stiff etiquette. Peterborough was a personal friend of Marlborough, who had himself inspired the appointment, knowing that the new commander could make up for his lack of military knowledge by other

qualities. As events were to prove, he possessed abundant strength of character, combined with a clear perception of essentials in war, and a singular gift of resourcefulness. Unfortunately, he allowed a difficult and cantankerous temperament to mar his relations with his colleagues.

After reaching Lisbon, Peterborough held a council of war, at which it was decided to attempt a landing in Catalonia. In the Archduke's entourage was the German Prince George of Hesse-Darmstadt, who knew Spain well, and had formerly been Governor of that very province. His information was to the effect that the province was seething with revolt, and that his many friends there were eager to welcome the Austrian claimant. Accordingly, Peterborough's force sailed from Lisbon on 24th July, first for Gibraltar and then up the Mediterranean coast to Barcelona. On 16th August, the fleet reached that city and anchored two miles along the coast North-East of the city. The Allied commanders assembled for a council of war on board H.M.S. " Britannia," flagship of Admiral Sir Cloudesley Shovel.

Barcelona, then as now the largest city of Spain, was at that date strongly fortified on the land side by an encircling wall with moat and towers. Strong batteries protected the harbour against attack from the sea. The place was known to be defended by a garrison of some 4,000 regular Spanish troops, loyal to the French King, under a determined Governor, Don Francisco Velasco. The Catalonian inhabitants of the city were doubtless favourable to the Archduke, but could not be expected to rise in arms against the garrison,[1] although in the surrounding hills a number of irregular partisans had taken up arms in response to a proclamation issued by the Allies. For the rest, the Allied force consisted of some 6,000 soldiers, two-thirds British and one-third Dutch. Field artillery they had none, but the Admiral promised all possible assistance by landing guns and seamen from the fleet.

Nevertheless, success appeared very doubtful. North of the city the ground was open and low-lying, facilitating a landing and affording good camping-ground ; but near the walls the low ground was so marshy that it would be impossible to dig trenches close to the enemy's ramparts, so that even if guns could batter a breach, the eventual assault must needs cross some seven hundred yards of open ground swept by fire. Inland of the city the ground was more favourable, but the attacking force was too small to invest completely the long perimeter of the walls or to risk being cut off from the beach. South of the city rose the steep hill of Montjuich, crowned by the outlying fortress of that name, which overlooked rocky and dangerous beaches at the foot of its precipice.

[1] A certain similarity will be observed between the situation of Peterborough's expedition and the situation of the British expedition outside Archangel on the 31st July, 1918.

Proverbially, a council of war never fights, and the assembled Allied commanders were definitely daunted by the difficulties before them. The majority recorded their opinion against attempting the siege in no uncertain terms. But the Archduke and Prince George considered themselves pledged to their Catalonian supporters. Their express wishes overbore the dictates of caution. It was decided to make an attempt against the city, though a time limit was fixed at eighteen days. Peterborough gave orders for the troops to land.

On 17th August, the force disembarked, welcomed and helped by the country folk, who waded into the water and carried the leading grenadiers ashore on their backs. A position was occupied on the low ground a mile North of the city, and defensive entrenchments were thrown up. The garrison of Barcelona remained cautiously within their ramparts, attempting no sally against the invaders, while from the surrounding hills several hundred Catalonian irregulars came down to offer homage to the Archduke as their new King. These irregulars, known as " Miquelets," were of little value in open fighting, but served well enough to harass Velasco's outposts and to interrupt his communications with Madrid.

For several days indecision prevailed in the Allied camp. A second council of war on 22nd April was no more encouraging than the first. In the opinion of the majority, there was no chance of success; still Peterborough temporised, wishing to do everything possible to meet the Archduke's desire. His position must have been difficult, for his British subordinates saw no hope, while his Dutch colleagues were definitely against the undertaking, declaring that on a given date they would re-embark their forces. But the British Navy, as ever, was optimistic; Sir Cloudesley Shovel landed 50 guns with 1,500 seamen who erected batteries and opened an effective fire against the city's northern walls. There was no possibility of concealing the selected point of attack, and the Spanish Governor was able at his leisure to strengthen his defences and construct a second line of ramparts as the outer walls crumbled under the fire.

The details of the discussions that took place during the ensuing fortnight are sometimes contradictory and always involved. Peterborough exasperated his wavering colleagues by changing his mind, or appearing to do so, in the most inconsistent manner. At last things came to such a pass that the Allied leaders were hardly on speaking terms, while the troops were openly expressing discontent at their futile proceedings. Finally, on 12th September, Peterborough announced definitely that the siege was to be abandoned. Operations were to be transferred further South to the district of Tarragona. The guns and

stores would be re-embarked with some of the troops. The remainder of the force would march South by land. Since the city was not completely invested, there was little to prevent information passing from the Allied camp to the enemy. Peterborough's orders to end the siege were communicated to Velasco almost as soon as they reached the Allied troops, and he lost no time in spreading the news. He announced a solemn celebration of the happy deliverance for the evening of that Sunday, 13th September.

But Peterborough's apparent vacillation and orders to abandon the siege had in reality cloaked a very different design.[1] After due consideration of the situation, he had realized that the key to success was the fortress of Montjuich, which lay on the far side of the city, and out of cannon shot from the walls. Nevertheless, from its height it overlooked those defences, and the sloping ground below it was suitable for the trenches necessary in a formal attack. Furthermore, he had information[2] that, although the citadel of the castle was strong, the outer walls were only partially complete, while the garrison of the fortress maintained no special precautions. It was unlikely that an open attack on the fortress would have any success, and the best hope lay in surprise. To ensure that surprise it was necessary to mislead his own followers as to his intentions if he was also to mislead the enemy. By his erratic conduct he completely succeeded in attaining that object.

On the afternoon of 13th September, the Allied camp was struck. The stores and the ships' guns were dragged down to the shore and re-embarked, while with many bitter words the countryfolk watched the bulk of the Allied army file off to the beach. That evening from every tower and steeple in Barcelona bells rang by Velasco's order to celebrate the event. Meanwhile, at dusk, the remainder of Peterborough's force formed up in the dismantled encampment. The force consisted of four British battalions—Rivers' Regiment, now the Royal Warwickshire, Lord Barrymore's, now the Somerset Light Infantry, Lord Donegal's, now the 1st Royal Sussex, and Lord Charlemont's, now the 2nd Worcestershire[3]—together with two companies of Dutch infantry and a squadron of the Royal Dragoons escorting some baggage wagons.

[1] This is the only reasonable interpretation of the events, and is put forward as such by Brigadier-General Ballard, pp. 146–7. Colonel Parnell, of course, maintained a contrary theory; but Colonel Parnell is in a minority of one against the other historians, and his violent prejudice against Peterborough invalidates his view. The subsequent campaign in Valencia gave proof of a similar subtlety.

[2] Probably from personal reconnaissance; but c.f. Richards.

[3] The last two were newly-formed units, and this was their first serious engagement. Rivers' and Barrymore's were older regiments, veterans of the wars of 1689–97, but recently filled up again with new recruits.

After nightfall, this force moved off, headed by an advanced guard formed of the grenadier companies of the four British battalions, grouped under command of Colonel William Southwell of Rivers' Regiment. The main body was commanded by Colonel Lord Charlemont, followed by a rearguard or reserve force with the baggage, under Brigadier Stanhope.

Peterborough at last communicated his real intention to Prince George, who, previously hostile, now eagerly asked permission to accompany the attacking force as a volunteer.[1] The two leaders mounted and rode after the marching troops, catching up with the column some ten miles along the road at the monastery of St. Gracia. There the direction changed to the southward, and the march was continued over a rough road to the village of Serja. Again direction was changed, this time to the East. Led by guides furnished from the " Miquelets," the weary troops tramped onwards through the darkness. At length, shortly before dawn, the column halted and closed up in a hollow on a rough hillside. The exhausted soldiers promptly fell asleep, while Peterborough quietly assembled his officers and explained the situation. The long night march had taken them right round the city: they were now on the slope of Montjuich: the baggage wagons escorted by the Dragoons carried scaling ladders collected from the surrounding countryside: at dawn they would attack the fortress and carry it by assault.

At the first light of day the troops were roused and the attacking columns went forward up the hill. A sharp fire from the Spanish outposts met the attack, but the storming parties, gallantly led by Colonel Southwell and Lieutenant-Colonel Allen, charged up the slope, planted their scaling ladders against the outer walls and swarmed up them to the top of the ramparts. Amid heavy firing, they stormed the outer walls,[2] and after fierce hand-to-hand fighting drove the defenders back pell-mell into the citadel. Then they threw up a temporary breastwork of loose stones, and prepared to hold their gains while Peterborough himself rode back to bring up Brigadier Stanhope's reserve and to make a rapid reconnaissance of the situation.

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[1] Colonel Parnell's theory is that Hesse-Darmstadt conceived the whole plan and induced the reluctant Peterborough to agree. There is not a shadow of evidence to support this view, and we must agree with Brigadier-General Ballard that it is most improbable, " especially when that (British) commander was a bad-tempered little man, with a very high opinion of his own dignity."

[2] The first to mount the wall seems to have been " Captain-Lieutenant " Rycault of Lord Donegal's regiment, now the 1st Royal Sussex. He was killed immediately afterwards. The information is obtained from an extant petition from his widow for a special pension, stating that he was specially commended for his gallantry by the Prince of Hesse-Darmstadt.

Meanwhile, the firing at Montjuich had alarmed the city below, and Velasco hurriedly despatched a reinforcement of Dragoons, each bearing an additional foot soldier mounted behind him on the crupper of his horse. These reached the fortress just as Prince George, with rash gallantry, led forward Colonel Allen's men in an attempt to storm the citadel. A confused fight followed and the attack was beaten back. Colonel Allen and many of his men were captured, while the German Prince fell mortally wounded. Then followed one of those strange panics which at times carry away even the bravest troops. It must be remembered that most of the British troops were young soldiers, fighting their first serious engagement; they were tired out by their long march without food or proper sleep, and they can have had but a confused idea of the situation. A voice raised an alarm that the Spaniards were surrounding them; a voice gave an unauthorized order to retire. A few brave men kept their heads and held their ground on the outer wall of the fortress, but the bulk of the attacking force hurried back in confusion, poured out of the opened gate down the hillside beyond. Fortunately at that moment Peterborough, having completed his reconnaissance, and hearing of the retirement, came galloping up the slope, wild with rage. "What he said, no writer has dared to set down," writes Sir John Fortescue. Single-handed he checked the rout, rallied the young soldiers and led them back up the hill to the fortress. By good luck, the Spaniards had not pressed their advantage, the brave remnant had maintained their position on the captured walls, and soon the situation was completely restored.

Meanwhile, Colonel Allen and the other British prisoners had been escorted down to the city. Their capture proved a blessing in disguise, for the news that the main force of the Allies with Peterborough in person was attacking Montjuich decided Velasco to risk no more piecemeal reinforcements, but to concentrate his men for the defence of the city walls, and to leave the outlying fortress to its fate. Peterborough brought up all his force and secured his position on the hill of Montjuich. Then the Royal Navy again took a hand. Stores and guns were landed on the beach below Montjuich and, with great labour, hauled up the slopes. The citadel was bombarded for three days, until on 18th September a shell pitched into the powder magazine, which exploded and wrecked part of the walls. Catalonian Miquelets and British soldiers together went forward to the assault, and the remnant of the garrison surrendered.

The whole aspect of affairs had now altered. The Allies and their Catalonian sympathisers were in high spirits, while Velasco's garrison was correspondingly depressed. Batteries were planned on the slopes between Montjuich and the city to face the southern walls, and Sir

Cloudesley Shovel again landed a large number of guns and men, this time on the beaches South of Montjuich. The beaches were dangerous and the slopes steep and difficult, while no animals could be procured to drag the guns; but the sailors were never at a loss, and a certain Captain Littleton "caused harness to be made for 200 men, and by that means, after prodigious labour and fatigue, brought the artillery up to the batteries."

By 24th September all was ready, and the new bombardment was commenced. At the same time, the ships of the fleet intermittently engaged the harbour batteries on the seaward side. The young Archduke, now in the highest spirits, took the greatest interest in all the operations, dividing his time between sea and shore, and on at least one occasion persuaded the Admiral to allow the flagship "Britannia" to fire a complete broadside for his own special edification.

Within a fortnight the bombardment had achieved its object. A practicable breach had been made, mines planted by the enemy to defend it had been exploded, and all was ready for the assault. Peterborough then sent a formal summons to Velasco, offering him terms of surrender, which the latter was glad to accept. The townspeople were on the verge of revolt, while many of his regular troops were ready and willing to change sides. He signed the capitulation under which he and his garrison were to march out with the honours of war. No sooner was the surrender made known than the threatened revolt broke out, and the Allied troops had to occupy the city forthwith to save the French sympathizers from massacre. On 9th October, the British and Dutch marched in to restore order, Peterborough himself enjoying an adventure after his own romantic heart in personally rescuing the beautiful Duchess of Popoli from rough handling in the streets. A fortnight later, the Austrian Archduke formally entered the city, and was enthusiastically welcomed as King. Most of Velasco's Spanish regulars had gone over to his side, and the whole of Catalonia rose in his favour. The first phase of his bid for the Spanish throne had ended in a triumphant success.

Unfortunately, that success was not to last. In the next year, 1706, Peterborough carried the war southward into Valencia, where he routed and discomfited his opponents in a series of minor operations, as brilliant as they were unconventional. A French army advanced against Barcelona and the city was again besieged, but Peterborough, with the help of the Royal Navy, raised the siege, and forced the baffled French to retreat: another example of the value of sea-power. That, however, was to prove the limit of his success. Soon after this relief of Barcelona, an Anglo-Portuguese army under Galway and Das Minas,

advancing from Portugal, reached and occupied Madrid where they proclaimed the Austrian Archduke. But the proud Castilians showed no enthusiasm for the invaders' nominee. In the following year (1707), quarrels among the Allied commanders reached such a pitch that Peterborough resigned his command and left the country. With his departure fortune deserted the Allied cause, and in April, 1707, the Anglo-Portuguese army was completely defeated at the battle of Almanza by a French army under the Duke of Berwick. That battle decided the issue in Spain, though for three more years the war dragged on along the Portuguese frontier and in Catalonia, where the British troops gained a victory in 1710 at Saragossa, followed by another crushing defeat at Brihuega.

Nevertheless, that unfortunate issue of the war in the Peninsula should not be allowed to blind us to the brilliance of the opening achievement. Seldom has any commander been faced with a more difficult problem than Peterborough when he landed before Barcelona; seldom has a more striking success been gained, due no doubt in part to good fortune, but richly deserved by the ingenuity and resolution of the commander, the gallantry and endurance of his men, and the hearty co-operation of the Services. Barcelona was among the earliest of the many combined operations of the British Navy and Army; it deserves to be remembered as one of the most successful.

THE FUNCTIONS OF THE TERRITORIAL ARMY

By Colonel P. L. Hanbury, C.M.G., D.S.O.,
Assistant-Director of the Territorial Army.

On Wednesday, 8th January, 1930.

Lieut.-General Sir Reginald B. Stephens, K.C.B., K.C.M.G.,
Director-General of the Territorial Army, in the Chair.

The Chairman introduced the Lecturer.

LECTURE.

WITHIN the last few years there has been delivered before this Institution one lecture dealing with the Territorial Army, while a number of articles on the same subject have appeared in the Journal.[1] That lecture and, in particular, one article[2] are of importance in that they emanated from two acknowledged authorities on the characteristics of that Army. There is, consequently, little room for me to go over the ground that has already been so adequately covered. I will, therefore, attempt to touch chiefly upon the recent progress made by the Territorial Army in certain directions. I would only ask you to remember, in the course of my remarks, that I am only a Staff Officer and do not hold high office in the Army or in the Government.

I. The Evolution of the Territorial Army.

The important position which the Territorial Army holds as the hub of our national Land Forces of to-day is a fitting tribute to the truly marvellous foresight displayed by Mr. (later Lord) Haldane when, in 1908, he converted our heterogeneous Volunteers into the Territorial Force. I will not recall the state of chaos which reigned at the time, nor of our absolute unpreparedness for anything in the nature of a European War, but I think certain extracts from Hansard of 1907 afford indications of the atmosphere in which Mr. Haldane presented his plan to Parliament.

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[1] "The Territorial Army." Lecture by General Sir Ivor Maxse, K.C.B., 10th March, 1926; published in the R.U.S.I. Journal, November, 1926.

[2] "Some Territorial Army Problems." Article by Lieut.-General Sir Hugh Jeudwine, K.C.B., R.U.S.I. Journal, May, 1928, p. 511.

The following comments will be found there :—

" The House of Commons took little interest in the debates, and they were without expert knowledge of military affairs. . . . Not one professional soldier was there whose opinion carried weight outside."

" One result of the new scheme must be to destroy such Corps as the Inns of Court, the Post Office Rifles and the H.A.C. These Corps must vanish. . . . "

" . . . did not believe that soldiers, as soldiers, would endorse this scheme."

" The present civilian force is a sort of sham Regular Force, called the Territorial Army instead of volunteers."

" Mr. Haldane's proposals have nothing that can recommend them to anyone who wishes England to provide itself with an army suitable to our position at home and our scattered Empire in many distant provinces. . . . "

Other references were made to the Territorial Army as " This County Council Army " and " This mongrel Force."

There was, however, a noteworthy remark made by Mr. Haldane himself :—" The Colonial Premiers at the Conference have unanimously decided that this is the best pattern of organization, and that, just as we propose to organize the Territorial Force here for Home Defence, they propose to keep that pattern in view in the organization of their Home Forces, so that we may have not merely 300,000 here, but a chain of Territorial Forces throughout the Empire, which may give us some real security."

I must confess I feel little surprise at the hesitating acceptance of Mr. Haldane's scheme, for who would not look askance at proposals which purported to produce fourteen Divisions scattered all over the face of the country, leaving their training only in military hands, and handing out the entire administration to ninety civilian bodies ? Yet therein did Mr. Haldane show the niceness of his judgment of the British character and of the country's capacity and willingness to shoulder the burden. It was this policy of entrusting the recruitment and maintenance of Territorial units to county civilian authorities, while leaving the training only in the hands of the military, which has ensured the lasting success of the Territorial Army. In no other way could it have hoped to withstand the test of time.

I do not suggest that the system of dual control, civil and military, does not offer some disadvantages. For instance, the 53rd Welsh Division, being split up among fifteen counties, is administered by fifteen Territorial Army Associations. The 43rd Wessex by six Territorial

Army Associations; at the other end we have the 55th West Lancs. and 56th 1st London with only two, and the 47th 2nd London and 49th West Riding with one each. It is evident that a Divisional Commander has no easy task in dealing with a large number of Associations and co-ordinating a common policy, but in this task he is generally assisted by special joint committees of Territorial Army Associations, which are set up to deal with matters of common concern.

II. The Territorial Army of To-Day.

Anyhow, the proof of the pudding is in the eating. Except as regards the title—the old Territorial Force is now the Territorial Army—The Territorial and Reserve Forces Act of 1907, passed to raise the Territorial Force, whose first and essential duty was service in Great Britain, still stands unamended for this same Army. But there has been added to its first duty a liability for service overseas. This feature has grown in importance to the extent that in future the Territorial Army forms the sole means of expansion of our land forces for any operations which the Regular Army cannot undertake by itself.

Accordingly, the responsibility which rests on the Territorial Army could not be greater. It is thus for the country to see that this Army is given a fair hearing and a full measure of support.

It is, therefore, of interest to consider the strength of the Territorial Army during the past four years :—

	Strength.	*Decrease.*
In 1926	140,365	—
1927	133,286	7,079
1928	133,027	259
1929	130,000	3,020

It goes without saying that such a significant drop in the strength in these last few years is a most disturbing factor. Apart from the abolition of the Bounty and its replacement by a smaller Proficiency Grant, the principal reason for it seems to be, without doubt, the present demand for a reduction of armaments, and the strong sentiment in this country in favour of peace and against war. This sentiment, however, takes little account of conditions in other countries or in the outlying parts of our own Empire, where bellicose sentiments, increased armaments and incitements to violence are apparently the order of the day.

Those people who believe that the best way to achieve peace is to disarm their own country, regardless of others, gain encouragement from such a pacific atmosphere, and their efforts are undoubtedly having an adverse influence on the minds of many would-be recruits who

might otherwise fulfil their latent ambition. One can quite understand the quandary in which such men find themselves.

We know that Territorial Army Associations, commanders of units, and all closely concerned with recruiting, are doing everything possible to improve matters. I think we should also remember that these strong revulsions towards everlasting peace always follow a war just as an anticyclone or calm generally follows stormy weather. History shows it has always happened thus. After the French Wars of Napoleon, when he practically overran Europe, there was this same desire for peace, and yet since then wars, both great and small, have occurred. It is true that there is no great European war in sight at the present time, and that since it was reformed after the war there has been no call on the Territorial Army. To some this may seem an argument for its abolition, but to those who have studied events during these years, it must be clear that if there had been no Territorial Army it would either have been necessary to create one, or else to make large increases in our regular forces. Considered in this light the Territorial problem assumes a different aspect.

The Regular Army of five divisions, highly efficient and mobile as it may be, is a very small army. We are charged with commitments, widespread over the world; and we have to guard communications that are flanked by foreign powers not necessarily friendly to us. Our Regular Army, wholly or in part, may be required to protect our own people or interests anywhere in the world at short notice. Since 1918 there have been numerous emergencies, involving hurried movements of troops to Egypt, Palestine, Iraq, Chanak, and no sane person can be sanguine enough to feel sure that there will be no more in the future. About two years ago we formed a Defence Force of approximately one division for duty in Shanghai, which turned out to be mainly police work. Without that Regular Army one dare not imagine what might have happened there.

Admitting the Regular Army to be called away, what have we to fall back upon? Nothing, except the Territorial Army, which has always, as its first task, Home Defence—both on the ground and against air attack—while, in addition, it must be prepared to undertake its other rôle of expansion.

III. The Terms of Service.

It is a fact that originally Territorial recruits were enlisted for Home Service only. Now, however, all officers and men, when they join the Territorial Army, have to sign an undertaking that they are prepared to serve overseas. This fact accounts for certain matters which have

to be adjusted before the Territorial Army is allowed to expand to War Strength.

A man enlists for a county corps, and he is posted to a unit of that county. On enlistment he is given a promise that he will not be removed from the unit into which he has enlisted except with his own consent. For example: if a man joins a corps of the Middlesex Regiment, he cannot be transferred to an infantry unit of another county. The promise given to him is perfectly clear; he cannot be cross-posted to any other unit, i.e., a recruit, on attestation, is posted to the 370th Battery, and the promise makes it impossible to transfer him to any other battery. In peace-time these limitations are all to the good, as they mean that a man is certain of remaining in the unit of his choice. No necessity arises of compulsorily transferring him from one unit to another. But in war I need hardly point out the difficulty of such a situation. Still, if the matter be carefully considered, the difficulty becomes not so great as it appears. There is, in fact, no intention of breaking the promise given to men at present serving in the Territorial Army. The number of these men is really small, when compared with the war strength of the fourteen Territorial divisions on mobilization. There are, at this moment, 129,000 serving Territorials, and before they take the field they would have to be passed medically fit for service, and some would be required to form cadres for expansion. The residue would still have the right to remain in their units, but it is not anticipated that any great inconvenience would result from that fact. But in time of war there would be one form of enlistment for both Regular and Territorial Armies; that is to say that in the next war there will be one Army and one Army only.

IV. The Expansion of the Territorial Army.

I will now deal shortly with the process of expansion of the Territorial Army from a peace to a war footing.

(1) *Embodiment.*—On the issue of a proclamation ordering the Army Reserve to be called out on permanent service, His Majesty may order the Army Council to embody the whole or part of the Territorial Army. If the proclamation calls out *all* of the 1st Class of the Army Reserve, the Army Council must embody the Territorial Army, unless an address has been presented to His Majesty by both Houses of Parliament praying that such directions shall not be issued. These directions shall not, unless the emergency so requires, be given until Parliament has had an opportunity of presenting such an address.

By this process of embodiment the Territorial Army is brought on to the peace-time footing of the Regular Army, and becomes subject

to Military Law.[1] Embodiment is carried out at unit headquarters, where preliminaries, such as medical examination, are seen to. At the required time, units are moved to concentration areas for intensive training. If the circumstances require a further expansion of the military forces, units will, on moving to concentration centres, leave behind cadres for the purpose of raising duplicate units—that is to say, further divisions up to whatever number may be required by the circumstances of the war which we are meeting at that particular time.

(2) *Mobilization.*—This follows as and when required.

(3) *Modernization.*—In 1920, when the Territorial Army was re-constituted, we were faced with this situation. The Regular Army was marching with the times and developing organization and armament suitable for new requirements. The Territorial Army only possessed the old pre-war units and an organization which had become out-of-date. But as there was to be only one army, there must be only one organization. Therefore, plans had to be laid such as would achieve and would ensure in future wars a uniform armament. The last division must go overseas as well equipped as its predecessors. To effect the necessary changes in the Territorial Army, an arbitrary disbandment of redundant, and replacement by new, units was unthinkable, for it would have entailed the death of some of the oldest and most distinguished regiments. Yet the fine instinct which pervades the Territorial Army made re-organization easy, since the Yeomanry readily accepted the new situation, and with the exception of fourteen regiments which were to be retained as Yeomanry, all, with one exception, accepted conversion into other arms —mainly artillery and armoured car companies. The bulk of our further artillery requirements were thus obtained. Little was done towards raising light artillery because the policy in this direction is not definitely settled.

(4) *Mechanization.*—The next question was the best way to develop mechanization. The Territorial Army willingly turned its attention to the problem, but we were faced with this difficulty. Were we justified in issuing to the Territorial Army very costly vehicles which, however new they were at the time of issue, in view of the rapid development of machinery, might soon become obsolete? This measure would have involved locking up much money in vehicles which, in all probability, would be out of date before they were required in war, and certainly long before they were worn out. Clearly such a course would be wasteful and of little value, and so the obvious policy was

[1] In this connection I should explain that in peace. Territorial Army officers are always subject to Military Law, while the men are only subject to it when called up for training.

evolved. Let the Regulars experiment on improving organization and testing new mechanical devices, while the Territorial Army awaited the result of experiments and continued with such peace-time makeshifts as met the training and tactical requirements of the arms concerned. An example of this policy is to be found in the conversion, going on at the moment, of Territorial Army infantry to conform with the Regular Army organization. It has been more strikingly demonstrated by the Regular 9th Field Brigade, which was seen training with the "dragon," while the Field Artillery of the Territorial Army was training with the old Fordson for its tractor. Similarly, while the Regulars were working with modern tanks, the Territorial Army armoured car companies were still struggling with the Peerless cars, which are now accused of travelling rather less than 600 yards to a gallon of petrol and of towing each other to camp! It needs an optimist to compare a Fordson tractor with the dragon, or the Peerless armoured car with the latest tank. Fortunately, the six-wheeler has now appeared, and has been found suitable to supplant both the Fordson for the artillery and the Peerless for the armoured car companies. The system of letting the Territorial Army use commercial and out-of-date vehicles to represent in peace its engine of war is sound so long as it is not overdone. Mechanization means the replacement of men and animals by machines. It has enabled us to reduce establishments while maintaining an ever increasing fire-power and mobility at a reduced cost.

But for the intelligent use of commercial vehicles, mechanization of the Territorial Army would have been prevented for obvious financial reasons. As it is, we have made very definite progress. Besides, in addition to the armoured car companies, we have all our medium artillery on a mechanized basis, more than half our field artillery, and now the Signals, R.A.S.C. and R.A.M.C. are taking it up.

V. Territorial Training.

The increased importance which the Territorial Army has assumed in its new rôle since the Great War has stressed the need for its careful and up-to-date training. Training is far more advanced to-day than in 1914. Broadly speaking, the training divides itself into two categories :—

(i) *Out-of-Camp Training*—carried out in drill halls and local drill grounds;

(ii) *Annual Camp Training of fifteen days.*

During the former, nothing much beyond individual and weapon training can be carried out. Nevertheless, week-end camps are held in the spring as a first step towards more advanced training in summer camp. The above satisfy the requirements of non-specialists, but the

enormous increase in technicality which has developed renders essential the holding of special courses.

The Territorial Army is not a large one. It has fourteen divisions and Army troops; these, at the present time, are represented by 6,595 officers and 129,153 men, out of an establishment of 7,700 officers and 170,000 men. Establishments are kept as low as is compatible with the efficient training of leaders. Various arms differ, but, generally speaking, the establishment is within the vicinity of 60 per cent. of war establishments. That means that for war we shall have to take in a very large number of men. Furthermore, the number of Territorials with war experience is growing ever smaller, which means that the Territorial Army is becoming increasingly dependent for its training on the Regular Army, if it is to maintain its present high efficiency. Therefore, our main object in peace must be to produce efficient leaders and specialists. Here it is that we meet our greatest difficulty. The Territorial is only free to acquire military knowledge during his leisure hours. Indeed, his annual camp training takes place during his yearly holiday. To most men absence on courses lasting several days or weeks is out of the question; therefore, we have to devise means of fitting in specialists' training at hours and places convenient to the pupils; nearly every private is now a specialist of one sort or another. Week-end courses and tactical exercises are held, but these are not enough. Courses of longer duration are available for the few who can get away for them. There remain the Command or Division Schools, which provide for night-time training.

We are endeavouring, at the present time, to institute and develop such schools in big towns. The best existing example of this nature is the London District School of Instruction, whose curriculum is drawn up to meet the most evident requirements of the Territorial Army, and to enable Territorials to attend in as large numbers as possible. Of course, schools of this type can only be successfully maintained in large towns where a good number of units are raised. I should like to see them tried in places like Birmingham, Glasgow, Edinburgh or Manchester. As an example of what can be done, I might mention the instance of a young Territorial officer who lives at Woking, yet recently completed a fortnight's course at the London District School of Instruction; during that fortnight he would reach home from his work, civil and military, after 10 p.m. I adduce this example to show the enthusiasm of the Territorials and how useful schools of this type can be.

VI. Regulars and Territorials.

If we are to weld the Regular and Territorial Armies into one Army the regimental spirit must be fostered. The main link between the

two is the adjutant and the Permanent Staff instructor. These are drawn from the Regular unit of the regiment and, therefore, there exists at all times a live connection between the two. We also look to the Depots to assist their Territorial Army units in all possible directions. Furthermore—and this is done as much in the interests of these officers themselves as of the Territorial Army—the Senior Division of the Staff College is now attached to Territorial Army units or formations during annual camp training. Territorial Army units are always able to call for extra instructional staff from the Regular units of their own regiments. The amount of assistance thus obtained is necessarily limited by financial considerations and by the needs of the Regulars themselves.

With a view to closing up still further the ranks of the Regulars and Territorials, certain Regular and Territorial Army units in the Eastern Command camped together this past year. The experiment has proved successful, and this year we are to have a Territorial year, i.e., liaison with and the training of the Territorial Army are going to be the first charges on the Regular Army. Joint camps and combined training will take place, and I feel certain that the results will be of benefit, both to the Regulars and to the Territorials. It is essential that both types of soldiers should get to know, appreciate and understand each other thoroughly. Each will learn something from the other.

VII. Conclusion.

Such is the situation of the Territorial Army to-day, and such is its work. It is a subject worthy of our deep consideration, for we can all do something to help the Territorial soldier. To those who see no need to lend him a helping hand, I would say, what would you have done without him in 1914, and what would we do if another like emergency arose?

DISCUSSION.

Colonel Sir F. Carne Rasche, Bart., wished to draw attention to one reason why Territorial recruiting had fallen off lately, namely, the fact that camps do not take place near the sea with sufficient frequency. This does not tend to make the Territorial Army popular in certain units. They had to remember that the annual camp is, in very many cases, the men's only holiday. This opinion had been supported by all C.O.s of the speaker's brigade over the past eight years.

Further, if the Territorial Army is now being brought into line with the Regular Army, that is, the organization of the infantry battalion is being changed to three rifle and one machine gun company, would it not be possible to include in the peace establishment of Territorial battalions both an Intelligence Section and an Anti-Tank Platoon? As Territorials have to think in these terms at their

week-end trainings, it seemed as though they ought to work with them on battalion and brigade days at annual camp. As a matter of fact, some battalions have created Intelligence Sections of their own.

Finally, the speaker wished to add certain points which the lecturer had not touched upon :—

(1) "A good many of us have, from time to time, had not a few arguments with the chief of the Navy, Army and Air Force Institute on the score of the poor rebate allowed to Territorial units by that Institute.

"On the last occasion I was informed that we did not stand on the same footing as the Regular Army with regard to being supplied in camp. Whereas the Regulars are allowed to draw on the Ordnance for equipment for furnishing their Institutes, as well as on the Army Service Corps for transport, the same privileges were not allowed to Territorials. Consequently, the Navy, Army and Air Force Institute has to hire furniture, equipment and transport for such purposes. The cost of these items is taken out of the rebate. In our own case we wrote on this question to the Ordnance some weeks before our camp, but not until camp had started did we receive a reply. Perhaps an order might be issued that the Institutes working with the Territorial Army might, in future, draw Government equipment ?

(2) Regular units in standing camps are sometimes allowed extra equipment for greater comfort—extra tents, shower baths, etc. Last year, after much difficulty and trouble on the part of a certain Territorial Divisional Commander, each battalion of his command was finally allowed one extra store tent. This concession was greatly appreciated, while it saved officers' pockets, since this store tent was used as an ante-room or mess tent, which saved hire. Could this procedure not be adopted as a matter of course every year when such equipment is not being used by other troops ?

(3) Could anything be done to render the appointment of Territorial adjutant more attractive ? It is, especially in a scattered battalion, no easy task and, moreover, a thankless one. The extent to which this may be the case can scarcely be realised, except by those who have performed that duty or commanded a battalion under normal conditions. Many of these adjutants are candidates for the Staff College. Would it, then, not be possible for Divisions to have the power of occasionally nominating for entrance to Camberley one or two adjutants who have done exceptionally well in their appointment but have failed to secure admission to the Staff College, provided that they have qualified at the examination ? This would seem a suitable step in view of the importance now attached to the Territorial Army."

MAJOR J. M. REDDIE (Secretary of the Worcestershire Territorial Association), asked whether more information might not be given about the actual creation of battalions of regiments in time of war.

"The point, it seems to me, is this. In the Regulars serving at home and in the Territorials there must be a certain number of men who are medically unfit. We shall also have a great rush of volunteers at the beginning of any war. Where are we going to place them, and to what battalions will they be drafted ? Again, where are the men to go to when they come back convalescent ? I do not ask for any information which is secret, but we are faced with the great difficulty as to how, in any great emergency, we are to combine Regulars and Territorials.

My other point relates to Schools of Instruction. For instance, many of the young officers in my county find that they can get the best training for their civil profession by going to Birmingham. But if they also go to the Territorial School

of Instruction in Birmingham they can only return home perhaps at 10 o'clock at night. Moreover, they have to feed themselves. The grant for expenses is very small, and it seems to me that this is a point which wants serious consideration. If we are going to have classes of instruction in big centres, something more must be done to keep the young officer from being out of pocket. As an alternative, it might be possible in each command to create a Travelling School of Instruction, to be sent round at intervals to the various units. The Instructors could teach young officers, and possibly the senior N.C.O.'s at regimental headquarters."

THE LECTURER: I would prefer to answer questions as they arise.

The first point concerned Territorial Army camps. The speaker said that certain camps were not proving congenial to Territorial units, and that this resulted in poor attendance and general dissatisfaction. Now, these things are arranged locally. It is, of course, difficult to meet everybody's wishes. There will be a large proportion who perhaps want one thing, and yet another may want something different. If one takes the men further afield, of course, one comes up against the question of finance. One cannot always afford to take formations across the country and land them at a particular seaside camp where they might like to go, and training facilities are adequate.

The next point was whether certain units, which at present do not exist, are going to be inaugurated in the Territorial Army. On that point I can say that as regards units which will require to be raised for war purposes, there is a plan being elaborated for the expansion of the Territorial Army as a whole, which will certainly encompass the initiation of these units in due course. It is, of course, absolutely clear that the organization of the Territorial Army must be identical with that of the Regular Army in war. If there are any units missing in their peace organization, it is largely a matter of policy question and dependent on finance.

As regards Schools, the difficulty is partly overcome by pupils being allowed one day's pay for every six hours' work done.

In answer to the suggestion that adjutants might be rewarded for excellent work by an occasional nomination to the Staff College, I can say that a Staff College candidate who has performed such meritorious service is now given credit for it among his other qualifications when being considered for a nomination.

CAPTAIN R. H. ROHDE: As an officer just finishing a tour of duty at a depot, I should like to make the suggestion that the quartering of the Regular Army battalions should be re-organized so that every alternative station should be within, what I may call, "financial proximity" to their county.

Secondly, that the officer commanding a depot be allowed some travelling allowance for officially visiting his Territorial battalions, say, five times a year, so that he could really get to know the needs of the Territorial battalion commanders and be able to use his own resources to help them.

LIEUT.-COLONEL R. V. K. APPLIN wished to bring to notice that the Junior United Service Club was the first of the great Service Clubs to throw open its membership to officers of the Territorial Army. This certainly seemed a step towards the recognition of Territorial officers being on an equality with Regular officers.

COLONEL C. K. CODRINGTON wished to ask one question with regard to the Yeomanry. "After mobilization a regiment would presumably be in the position of having a majority of 'general service' members; when this situation has come about would the regiment lose its identity? One quite admits that cross-posting in any modern war will probably be necessary, but I suggest that it would be much fairer to men and to units if this possibility were publicly made known

to them on their joining instead of leaving it to come as a shock later on. Let us be honest about it and say so beforehand.

Mention has been made of the small amount of money available for travelling expenses. Now it may be assumed that members of town units will need very much less travelling money than the members of scattered provincial units. I suggest, therefore, that money for travelling expenses should be granted with some regard to the topographical situation of the unit. I suggest that units should be graded for travelling expenses, and for numbers of other things as well. Thus, Class A units would be the compact town units; Class B, scattered units; class C, exceptionally scattered units. Travelling or other grants would then be made on one scale for Class A units, on a more liberal scale for Class B units, and on a still more liberal scale for Class C units. This method would deal practically with the fact, which is becoming more appreciated, that units are not all similarly situated but vary infinitely in their circumstances and consequently also in their requirements."

THE LECTURER answered the previous points. " The first concerns the question of the attachment of Territorial battalions to their Regular unit in preference to a unit of another corps altogether. There is no question about the desirability of bringing the men to their own unit, as this follows out our whole basic policy. Unfortunately, in the case of long distances, the money question intervenes and prevents us doing what we would.

A further point concerned the question of the Depot Commander receiving no travelling allowance to visit Territorial Army units with which we want him to have liaison. The latter, I think, is an undoubted need. I will look into the matter and see whether anything can be done. I think this suggestion of expecting the Depot Commander to throw out his tentacles, as it were, to the Territorial units, especially if they are at some distance, is new. But it is certainly important, more especially as the time is coming when he will have, at least, one machine-gun instructor, who could possibly go out and hold some classes of instruction in Territorial Army units.

I am grateful for the point raised by Colonel Applin. The concession made by the Junior United Service Club in making Territorial officers eligible for membership is a great advance, and we hope most sincerely that other clubs are going to do the same.

Colonel Codrington raised two points. The first was about the Yeomanry. He expressed the fear that they might lose their identity in the process of expansion for war. I think I can allay his fears as regards that. Any Yeomanry regiment will remain as such in the role that has been made for it. I do not think there is any need to fear such loss of identity in any respect.

Next he dealt with a tendency to regard the whole of the Territorial Army as being formed of identical units, whether they live in town, or are scattered in the country. I know there has been an idea—one can feel it sometimes in the War Office—on the part of people coming in from outside who think that these points are not regarded with a clear mind. I can assure you that we get so many and varied opinions from people visiting us and from correspondence that we are fully alive to the position. It is realised that there is a big difference in almost every case between one unit and another. We give attention to every particular case that comes in.

In connection with the question of the Permanent Staff Instructor, we had a meeting in the War Office quite lately of the several branches concerned. We arrived at certain broad lines on which we are all agreed to work, so that we can

see eye to eye with regard to these requirements as they are put in, and we can make sure that, as far as the money will go, we may get sufficient instructors to cover the area of every unit."

[*Several additional points were raised and answered by the Lecturer, but as they related to requirements which, however desirable, are unattainable under existing financial conditions they have been omitted as being of no value for purposes of record.*—EDITOR.]

THE CHAIRMAN:

THE CHAIRMAN desired to call attention to one or two points. There was a point raised by Captain Rohde as to whether it would be possible to quarter a county Regular battalion somewhere in the neighbourhood of the Territorial units.

CAPTAIN ROHDE: What I said was within "financial distance" of the county.

THE CHAIRMAN: I will see that a representation is made to that effect. I think it is a good idea.

Then I should like to thank the Junior United Service Club. I think they have made a fine gesture, and I am going to see whether I can bring any influence to bear on my own Club.

Some of the things we have said to-night, from the War Office point of view, may appear unsympathetic. But they are not. We have the greatest sympathy—so far as the money will go. That is the crux of the situation. All these questions, one after another, are money questions, and money is tighter than ever this year. Therefore, it is not the slightest use our coming here and promising that we will pay expenses for officers to go to Schools of Instruction and other worthy things, which we know we could not make good.

The customary votes of thanks to the Lecturer and to the Chairman were then put to the meeting and carried by acclamation.

THE SUPPLY OF COOKED FOOD IN THE FIELD

By Major C. T. Beckett, M.C., Royal Artillery.

FOR some ten years past a number of trials of varying natures and of varying degrees of importance have been carried out regarding the problems of feeding troops in the field. Now at length a change of some moment, so far as the supply of food to the individual soldier under active service conditions is concerned, is to take place.

The Fuel.—The first problem arose out of the question of the most convenient and economical fuel for use under active service conditions.[1] The necessity for a change of fuel was due to the difficulty, existing in most Eastern countries likely to become a theatre of war, of obtaining wood or coal as a local supply. The necessity for importation of these bulky commodities must lead to considerable appropriation of shipping tonnage and rolling stock, whereby the expense of the material is augmented to a high degree. The shipment of petrol, however, is not likely to present great difficulties, nor are the freight charges incalculable in advance. The localities where petrol is produced and the factors which govern the cost of its transport are perfectly well understood, and the sources of supply, or of the refineries, are conveniently placed, having regard to areas of production and possible theatres of war.

In 1922, experiments began at Aldershot, the object of which was to adapt existing cooking vehicles to the combustion of heavy fuel oil. The initial selection of heavy fuel oil as the most desirable type was based, doubtless, upon the low price of the commodity in the open market, and upon the fact that at that time we had only just emerged from operations on a large scale in Iraq, where such fuel is readily obtainable as local supply. The state of flux of political conditions in the entire Middle East at the moment was, perhaps, not without its influence: a speedy decision was needed.

At that time, with the exception of the rearward services, draught in the Army was almost entirely animal. The combustion of heavy

[1] It must be remembered that fuel is not issued in the field for other purposes than for the actual cooking of food. Whatever difficulties may exist in keeping the troops warm would, in any case, be met on a different footing, and not on the plane of necessity on which the cooking of food must lie.

fuel oil, however, in existing horse-drawn travelling kitchens was found to be technically too difficult a problem for those vehicles to be converted economically. The dirtiness of the fuel and the quantity of smoke which was produced made success most improbable. Attempts were then made to achieve the combustion of heavy fuel oil on a trailer designed to be towed behind a mechanically-propelled vehicle. The change to mechanized draught simplified the problem to a certain extent, but a number of technical difficulties remained which were ultimately found to be insoluble when the vehicle on which the cooking apparatus was to be carried was restricted to the trailer class. As a result, experiments were continued on a prime mover, and a degree of success was ultimately attained, but not without a number of corresponding disadvantages. It is also worth recording that any material success in the use of heavy fuel oil would inevitably be accompanied by a material rise in price, which might remove its economic advantages.

Experiments with heavy fuel oil, however, were promising. Reliability had reached such a stage that the necessary tactical experiments to determine scale of issue and method of supply were immediately possible, and the heavy fuel oil apparatus, though uneconomical, was itself capable of burning petrol and a number of secondary fuels. Finally, the advent of the heavy fuel oil combustion engine as a commercial proposition made it advisable to continue to a conclusion the experiments then in progress, lest at some future date heavy fuel oil itself should replace petrol for motive power.

But long before experiments with heavy fuel oil had reached finality, the policy of mechanization had been developed considerably, and the likelihood of the petrol engine being present in every unit or formation had become a certainty. It did not, therefore, require much imagination to see that simplicity of fuel supply would best be attained if heavy fuel oil—itself a commodity foreign to normal supply in the field—were replaced by petrol, which, under the new conditions, would be ubiquitous. Experiments based on the proposition of petrol as the sole fuel for use in the field had already begun and were pursued on two lines. The first attempted to atomize the petrol completely and present it for combustion as a gas mixture, 95 per cent. of which was air ; the second was based upon the principle popularly exemplified in the Primus stove, where the admixture of air takes place immediately before the ignition of the gas, and in which the petrol is ignited under pressure.

The first of these methods, extremely attractive from the point of view of cleanliness and the presentation of the heat generated, necessitated too complicated a mechanism for field service conditions. Its initial expense also was high. The second, familiar to most people and

developed by the Automatic Fuel Supply Company in the Hydra Burner, was more attractive generally, and considered more likely to be efficient in the hands of troops. It was more readily adaptable to all conditions in the field, and experiments with this type of combustor were continued. For the initiation of both these lines of development the R.A.S.C. Training College were responsible.

The Vehicle.—While specially built bodies on prime movers are more convenient to the user, and are less difficult than trailers to manipulate on the line of march, the provision of prime movers means the immobilization in peace of large numbers of special vehicles and the consequent immobilization of much useful capital. Engine breakdown, moreover, deprives a unit of the special services of the vehicle, until another special vehicle is procured. The trailer, though its relative efficiency and convenience is less when in use, has none of these disadvantages; it is not subject to engine failure, or other failure foreign to its special purpose, and when in store is not monopolizing an engine which might be employed in a general service vehicle. The trailer was, therefore, selected as the most suitable vehicle for adoption, when finality of experiment permitted the War Office to consider the policy on which to go to production.

In 1929, satisfactory tactical trials which established the method of use and scale of requirements were carried out with the prime mover cooking vehicles upon which the oil-burning experiments were being concluded, and technical experiments with petrol-burning ranges had proceeded so far that it was possible to change the fuel and to revert to trailer portage without having to contemplate a further series of tactical trials.

The Stoves.—The accepted policy involved the provision of three sizes of cooking stove, designed for four types of activity.

(1) A single-burner stove, with which every armoured fighting vehicle would be equipped to carry it through operations in which it might be divorced from the comforts of its " B " Echelon vehicles, and capable of cooking food for ten men.

(2) A two-burner stove, designed primarily for those units or formations, such as Infantry Brigade H.Q., Cavalry Brigade H.Q. and Artillery Brigade H.Q., for whom no apparatus has been provided in the past, who have found their fuel and their cooking arrangements as the exigencies of the service permitted, but for whom the provision of petrol as a special fuel necessitated the provision of a special apparatus to burn it.

These stoves are designed also for carriage in pack, so that their issue may be made in convenient multiples to suit larger units where special

conditions would make the general service type inappropriate. They are designed to cook for 50 men.

(3) A general service type which has two roles. It is designed for erection as a stationary cooking range on the L. of C. or with rearward units, or it may be mounted on a trailer and issued in suitable multiples to the mobile fighting troops of a field army. It is designed to cook alone for not less than 250 men, but with the use of insulated cooking the output of the range is more than doubled.

With each of the two latter types, the stoves designed for 50 men and for 250 men, is provided an oven of sufficient capacity to allow for half its complement of troops to receive a roast, while the remainder can receive boiled or stewed food.

The Cooking and Delivery of the Food.—Simultaneously with the evolution of cooking apparatus, there have proceeded experiments to decide the best manner in which the food can be cooked and the most convenient quantities in which it can be delivered to the troops for whom it is destined. It was necessary to evolve a method of preparing and delivering the food which would take advantage of the mobility of the mechanically-propelled vehicle, which would reduce the number of vehicles in use in the service generally and in column on the line of march, while it would present the food to the soldier at whatever hour he required it at a degree of heat which would be both palatable and efficient.

With these objects in view, experiments in haybox cookery—now known as " insulated cooking "—were begun in the Aldershot Command in 1924, and with the progress in development of the cooking apparatus these experiments were co-ordinated, so that the whole might move forward together. It soon became apparent that the cruder types of hay-box were unsuitable for use in the field. The existence of hay and of wooden boxes was problematical ; their continued existence after issue was more than uncertain. Their size and bulkiness made reduction essential, while the necessity for co-ordinating the size of the pot in which the food was cooked with that in which it was necessary that it should be delivered and remain until the moment of consumption, made reconsideration of the whole problem inevitable. The maximum quantity of hot food to be delivered daily was settled at two meals, each of two pints, per man.

As the result of exhaustive experiments, it was found that boxes made of metal-faced 3-ply wood, known as " plymax," and insulated with kapok wool, were the most suitable form of insulator, while the great heat to which the pots were subjected and the long periods to which they were exposed to the corrosive activity of the food which

they contained, made the introduction of "staybrite" stainless steel imperative. Experiments with aluminium had been tried, but this metal was found to be unsatisfactory in the shape and form in which it was required, while the saving in weight was inappreciable.

Discussion now centred upon the size of the container in which the food was to be cooked and delivered. Existing cooking utensils ranged from 8 gallons to 1½ gallons in content. Demands for a 2-gallon container were put forward as being the most suitable content for the issue of food to small parties of troops such as existed in the field, and as being the most convenient size to handle. On the other hand, the cubic content of 6 gallons was considered more economical in weight, in man-power and vehicle space required to move the total volume, and last—but by no means least—in first cost and maintenance. Its contents, moreover, is half the food equivalent of a "Platoon," or similar formation in other arms, for one meal.

The following table is of some interest as showing how the projects compare from every aspect, except from that of the convenience of small groups:—

	Cost.	Dead weight to gallons useful content.	Insulative power. Hours.	Bulk in cubic inches per gallon content.	Men for portage.
One 6-gall. ..	£5 15 0	8.3 lbs.	17	793 c.i.	2
One 2-gall. ..	4 12 6	15.25 lbs.	10	1,000 c.i.	1
Three 2-gall. ..	13 17 6	—	—	—	3
Against the 2-gall. article	8 2 6	7 lbs.	7	200 c.i.	1
Volume for volume	150%	90%	70%	25%	50%

It was finally decided that a 1-gallon container and a 6-gallon container were the most suitable volumes in which to issue the food, the 1-gallon containers to be issued in pairs, so that the two types of food might be despatched at the same time to the small parties for which they were intended.

The actual proportion in which these articles will be issued to the Service is at present unsettled, but 25 per cent. of the total volume is considered as a suitable proportion for trial when estimating the number of 1-gallon containers. The remaining 75 per cent. of volume will be issued as 6-gallon vessels. This proportion applies tentatively to units such as cavalry regiments and infantry battalions, and others which are much split up. Units whose tactical employment does not involve such sub-division will doubtless receive a larger proportion of 6-gallon containers.

With satisfactory decisions on these points, it is possible to outline the tactical system which will be employed when considering the actual supply and issue of the food.

The kitchen trailers with their tractor vehicles, in which will be carried the insulators and containers, will normally be found brigaded under the Brigade Transport Officer with the other "B" Echelon vehicles. The location of these vehicles and the distances which they will maintain from the troops which they serve will depend upon the military situation. They may conceivably stay with their units. They will cook the food at rest, at any convenient time, and place it in the insulated boxes to continue cooking. For insulated cooking it is only necessary to bring the food to the boil, and its cooking thereafter continues in the box. There it can remain until the moment comes for its delivery, when the tactical situation, consideration for the troops' comfort, or the lack of congestion of traffic on the roads, permits.

As the temperature of the food does not fall below 140°F. during a period of from seventeen hours to ten hours, varying with the size of the container in which it is packed for delivery, this system allows a very wide degree of discretion as to when the food shall be despatched and when it shall be eaten. The hour of its arrival, therefore, subject to immediate tactical considerations, is a matter of indifference to the troops themselves. It can be retained and eaten at any convenient moment. The possible congestion of the traffic routes, owing to the despatch of ammunition, the advance of a mass of Armoured Fighting Vehicles or movement of a mass of artillery, can be entirely avoided.

There can be little doubt that the introduction of this system will be for the general benefit of the fighting troops and of the supply organization, and will by the elimination of bulky fuels decrease congestion on the L. of C. right back to the Home base, while it is certain that, with the minimum of exertion on his part, the soldier will always be assured of at least two hot meals at any convenient time during the twenty-four hours.

THE DEFENCE OF DAYLIGHT BOMBING FORMATIONS [1]

By Flight Lieutenant W. M. Yool, R.A.F., *p.s.a.*

In war, daylight bombing formations will be required to bomb targets situated at distances from their aerodromes which may vary from a few miles up to, under present conditions, some two or three hundred miles. As design progresses and the range of aircraft is increased so will there be a like increase in the distances which bombing aircraft may be required to traverse in order to attack their objectives.

During the greater part of such a flight they will usually be exposed to the risk of anti-aircraft fire and attack by enemy fighters, so that our bombing aircraft must be so designed that by reason either of their speed, of the height at which they fly, or of their defensive power, they will have a reasonable chance of reaching their objective and returning to their base in safety. They must, therefore, be capable of flying at a height sufficient to render anti-aircraft fire comparatively innocuous. This height can be laid down as at least 15,000 feet. Their speed, then, must either be such that they cannot be overtaken by the enemy's fighters, or they must fly in formation and rely on their fire power to defend themselves from attack. Owing to the greater load which the bomber must carry, the fighter type of aircraft will always be at least slightly ahead of the bomber in performance. Accordingly, the bomber will be unable to rely on his speed alone to secure him from attack, and must, therefore, adopt a defensive formation.

The aim of a bombing formation being to reach its objective, drop its bombs and return to its base in the shortest possible time, a straight course will usually be steered to and from that objective. Minor deviations from the course, or slight alterations in height, may be made from time to time with the object of confusing the anti-aircraft fire, or on account of the weather conditions. But at altitudes at which it

[1] This article is intended by the author to be a reply to "The Attack of Bombing Formations," by Air Commodore C. R. Samson, C.M.G., D.S.O., A.F.C. See Journal for February, 1930, p. 88.

is possible for the modern bombing aircraft to fly it is not considered that anti-aircraft fire will be able to make a well-drilled formation break up or alter course appreciably. Consequently, as they will normally fly on comparatively straight courses, it should be possible for bombing aircraft to maintain good formation throughout a flight, and thus make the most of the fire power they are capable of developing.

Now Air Commodore Samson states that, in his opinion, the bigger the formation the easier it is to attack it. In support of this view, he puts forward the opinion that the enemy is thus slower and less manœuvrable. This does not appear to be a sound argument, for a bombing formation does not require to be manœuvrable: in fact it would be a definite disadvantage if they were to manœuvre to any appreciable extent, as the accuracy of the fire of the rear gunners depends to a great extent on the aircraft maintaining a steady course. Even if it were possible to parry or evade an attack by manœuvring, it would mean deviating from the direct route to, and from, the objective, and many such deviations might easily prevent a bombing formation from reaching its objective, especially when operating towards the limit of the radius of action of the aircraft.

In addition, the bigger the formation the greater the fire power it will be able to develop; although this does not mean that our bombing aircraft should fly in large masses. The present squadron formation consists of nine aircraft, and this is considered to be the ideal number to enable a sound system of mutual fire support to be developed, and at the same time to maintain the compact formation which this necessitates. Bombing attacks on a large scale would usually be carried out by groups of two or more squadrons, flying comparatively close to one another, so that any enemy fighters manœuvring to attack any one squadron would probably come within range of one or more of the supporting bomber squadrons.

Turning now to a consideration of the methods of attack which the fighters will adopt, it appears certain that any successful attack can only be delivered from in rear, as the speed of modern aircraft is such that deflection shooting is unlikely to achieve results, whilst an attack from ahead when aircraft are approaching each other at over three hundred miles an hour, gives an impossibly small period of time in which to take aim and open fire effectively. When manœuvring to get into position to deliver an attack, fighter aircraft will, as Air Commodore Samson states, normally endeavour to launch their attack from ahead of, and above, the formation to be attacked, but the final phase of the attack, when fire is actually opened, must be delivered from in rear, if it is to be effective.

Air Commodore Samson is in agreement with many fighter pilots and other authorities when he states that to deliver an effective attack a flight of three fighter aircraft must, as a general rule, concentrate on one bomber, and that, therefore, a squadron of nine fighters should attack three bombers only out of a formation, leaving the remainder of the aircraft undisturbed. The writer, however, is not convinced that this is sound. The fighters, by these tactics, may possibly succeed in shooting down a bomber occasionally, but their own casualties will, in all probability, be much heavier, as the aircraft in the bombing formation which are not being attacked, will be able to concentrate their fire on the fighters without interference.

If, however, the fighter squadron could attack each of the bombers simultaneously with one aircraft, the fighters are more likely to be successful, as the bombers will then be unable to support each other, and the fighters, having each two fixed guns to the bombers, one movable gun, will be able to deliver a heavier and more accurate fire, whilst, in addition, the engine of the fighter aircraft provides partial protection for the pilot.

It is doubtful whether it is a practical proposition for each of the aircraft in a fighter squadron to attack each of the aircraft in a bomber squadron simultaneously. If it were possible it would certainly demand a very high standard of training on the part of the fighter squadrons. It is considered, however, that this is the only form of attack which is likely to be really effective, and then only against the single engined type of day bomber which is in service to-day, and which carries one back gunner with a single back gun. If a type of fast twin engined day bomber, similar to the Sidestrand, and carrying two or more back gunners, is developed, the advantage of the fighter in fire power will disappear and pass to the bomber.

The fighter's greatest chance of success lies in attacking aircraft which straggle from the bombing formation, and the aim of the bombers must be to prevent straggling. If they can do this effectively it is probable that as a war progresses the bombers should be able to establish a moral superiority over the fighters, which will render them increasingly free from interference. Moreover, if it be conceded that the best prospects of success are offered to the fighters if they can attack each bomber simultaneously, and that this is only possible if the fighter squadron has a very high standard of training, it appears that after the outbreak of war the bombing squadrons will be able to continue to maintain the compact formations which are their best means of defence, as their pilots will only have to be trained to fly in good formation on straight courses and gentle turns—which the inexperienced pilot can be taught

to do very rapidly—whilst the high standard required of the fighter pilots, in order to deliver effective attacks, will lead to a rapid deterioration, as under the strain of war it will be impossible to train fighter pilots up to the standard required in the short time which will be available.

Incidentally it may be mentioned that, although it is considered that fighters will only be able to deliver successful attacks from the rear, this does not obviate the necessity for the bombers to carry guns firing forward. If they did not do so the enemy would only have to provide two-seater fighters, which would fly ahead of the bombers on the same course, and thus give their rear gunners the opportunity of delivering an accurate and unopposed fire on the bombers.

The influence of weather has not been considered, although the average weather conditions tend to favour the bomber. The presence of any mist or clouds immediately increases the difficulties of the defence, as the bombers may be able to take advantage of the weather conditions to approach the target unseen from the ground, and thus prevent the anti-aircraft guns firing at them, whilst the task of the fighters in finding the bombers will be made more difficult. Our present purpose, however, is not so much to discuss how bomber squadrons are to evade the defence, as to discuss how they are to defend themselves when attacked, and it is the opinion of the writer that as long as they can maintain good formation they will be able to establish an ascendancy over the fighter.

To sum up, our daylight bombing formations must fly as high as possible in order to render anti-aircraft fire ineffective—a minimum height of 15,000 feet being considered necessary for this end; they must be capable of high speed (say 150 m.p.h.), so as to render the margin of difference between their speed and the fighters as small as possible in order to decrease the number of attacks which the fighters will be able to deliver in a given time; they must steer a practically straight course to and from their objective; and they must maintain good formation, so that the aircraft composing the formation can provide mutual support for each other and develop their maximum fire power to ward off attacks from the rear. By the adoption of these tactics it is considered that bomber formations will prove a formidable proposition for the fighter, and that as a war progresses the bomber formations should find it easier to replace casualties than the fighter squadrons, owing to the necessarily higher standard of training which the latter will require, if they are to be capable of delivering effective attacks.

COURT-MARTIAL PROCEDURE
A SUGGESTION

By Captain F. C. Curtis, Royal Signals.

". . . the Queen went stamping about, and shouting ' off with his head ' or ' off with her head ' about once in a minute."
(Alice in Wonderland).

TO some civilian minds the mere phrase " Trial by Court-Martial " may conjure up visions of Militarism in its most arbitrary mood ; a spectacle of an assembly of pitiless soldiers, who would pronounce capital sentences almost as readily as the Queen of Hearts, and certainly with just as little regard for the trifling extenuating circumstance that Alice and her companions had been issued with flamingoes in lieu of croquet mallets.

Anyone who has attended an actual trial, as even a civilian may, can derive much amusement from such imaginings ; for nothing could be further from the truth. Far from convicting innocent persons, it is generally agreed that a Court-Martial is more likely to give a man " the benefit of the doubt " than almost any other type of Court ; even obviously guilty men have been known to elude conviction on account of some pure technicality. In fact, no case whatever can be made out for the contention that the decisions arrived at are at all frequently unfair to the accused. Still, the procedure by which those decisions are reached is not entirely above criticism, and it is here proposed to suggest one way in which a small improvement could be effected.

The main complaint against the present procedure is that trials last an unconscionably long time. Simple cases of petty theft, which magistrates could—and would—dispose of in half-an-hour, are apt to occupy the time of five commissioned officers for a whole working day. The principal reason for this prolongation is that the President normally records, in his own handwriting, a pretty full statement of the evidence of every witness. This procedure obviously involves great delay. Nor is that the only reason why it is not altogether satisfactory. Many witnesses are quite unable to give their evidence in the form in which

a lawyer would like to see it written down. Some are discursive, whilst others find it hard to select any coherent words with which to describe what they have seen. So, with most witnesses, it is definitely not a practical proposition for even the most long-suffering President to record in full " the words used." It therefore becomes necessary to make a précis of what has been said, and, at the best of times, précis-writing is a difficult art.[1]

At a Court-Martial the composition of the précis is even more difficult than usual. For, in spite of the Prosecutor's opening address, the President cannot know exactly how the case will develop; and if he wishes to err on the safe side he is likely to include a good deal of matter which subsequently proves unimportant. Moreover, it is ever so easy, by the merest unintentional twist of a phrase, to convey a meaning quite different from what the witness wished to express. An example will help to make the last point clear. In a certain case the charge against the accused was one of fraud, and the prosecution, therefore, had to convince the Court that the accused had acted with a deliberately dishonest intention. The defence, on the other hand, sought to establish that the accused was an honest and normally inoffensive person, who had been led on to act in an indiscreet manner whilst under the unwonted influence of drink. In support of his case, which he had not yet had the opportunity to explain, the Defending Officer cross-examined one of the witnesses for the prosecution, and the following dialogue took place :—

D.O. : " How long have you known the accused ? "

Witness : " I've lived in the same barrack room and known him well for several years, Sir."

D.O. : " Is he the sort of person who makes a habit of going out and getting drunk ? "

Witness (emphatically) : " Oh ! No sir ! "

As a précis of this, it was proposed simply to record the words " Accused did not very often get drunk." Needless to say, it was pointed out to the President that such a record could easily be misinterpreted to mean exactly the opposite of what was intended, and, equally needless to say, the wording was amended. Nevertheless, the example does serve to show how difficult it is to abbreviate without sometimes also distorting the evidence.

[1] In the Annual Report on the work submitted by candidates for " School Certificates " in 1929 the English examiners of the Oxford and Cambridge Schools Examination Board state :—" The Précis was again the least satisfactory part of the work."

It is, of course, true, that the distortion is just as likely to favour the defence as the prosecution, and that every witness is given the opportunity to correct the record of his evidence. But these facts do not completely meet the difficulty. During an examination-in-chief "leading questions" on vital points are very rightly barred, and for even the most impartial person to say to a witness, "Listen to this and tell me if it is what you really meant," is a procedure which has many of the vices associated with "leading questions."

If it is agreed that the President's longhand record involves needless delay, and even so fails to provide the Convening Officer with an entirely satisfactory report of the proceedings, we must pass on to consider how the present procedure could be improved.

The most obvious solution is to make more frequent use of an expert shorthand reporter; and this solution is one which the author is loth to reject. Shorthand is becoming an increasingly common commodity in civil life, and there is much room for its increased use as a means of saving officers' time. If the author had his way, the establishment of clerks in all units would be reduced by 60 per cent., and the remaining 40 per cent. would have their pay doubled. If this were done, a high degree of skill at shorthand could be insisted upon, and there would then be no great difficulty in finding a competent reporter, either in peace or war. Failing this somewhat drastic reform, it would usually be necessary to secure the services of some civilian whose skill was beyond question. In war-time this might be difficult, and even in peace the cost would be well nigh prohibitive. The fees payable for a verbatim report of a morning's proceedings might amount to £15, and even if it were possible to make some allowance for the consequent saving of time, there would still remain too big a debit balance for this solution of the problem to be tolerated, except, as at present, in unusually serious or complicated cases.

Having ruled out shorthand, it is clear that we have to put up with précis-writing and the disadvantages which it entails. But this does not mean the abandonment of all hope for an improvement on the customary procedure. The author is of opinion that whatever else is accepted, the President should be relieved of actual writing to record the evidence. Moreover, a glance at Rule of Procedure 94 reveals that there is no legal objection to this being done. This Rule lays down that, in the absence of a Judge-Advocate, "the President shall record, *or cause to be recorded*[1] all transactions of that Court, and shall be responsible for the accuracy of the record . . ." It would, therefore, be quite in order for the actual writing of the evidence to be delegated

[1] The italics are the author's.—EDITOR.

to some junior member of the Court, and the President, thereby relieved of finger-numbing drudgery, would then find it easier to watch a witness's demeanour, and pay close attention to the wording of the summary.

This would sometimes be a step in the right direction, but the author would go further, and divide the duty of recording the evidence between the Prosecutor and the Defending Officer. These two officers are responsible for seeing that the two sides of a case are fairly and concisely presented to the Court. So the work of drawing up a précis of the evidence would fit in well with functions which they are normally called upon to perform. The examination-in-chief of a witness for the prosecution would be recorded by the Prosecutor; the cross-examination would be recorded by the Defending Officer, and the re-examination by the Prosecutor. Similarly, the examination-in-chief of a witness for the defence would be recorded by the Defending Officer, the cross-examination by the Prosecutor, and the re-examination by the Defending Officer.

The following advantages are claimed for this procedure:—

(*a*) Each side would be sure that the points of evidence which it regarded as essential were clearly expressed in the record.

(*b*) The record could be more brief, since the Prosecutor and the Defending Officer—having a previous knowledge of the facts of the case—would be prepared to omit a good deal of evidence which the President might not feel justified in omitting.

(*c*) The President would be relieved of much crude clerical labour, and could be on the alert to prevent any distortion of a witness's words.

(*d*) The slightly more active part in the proceedings, which would fall to the Prosecutor and the Defending Officer, would be good training for these officers who, in the natural course of events, may be expected to preside over Courts at a later stage of their career.

Lest anyone should consider this proposal too revolutionary, it may be as well to mention that there would still be the following safeguards:—

(*a*) As is usually done at present, the wording of the written record would be read aloud as it was being written down.

(*b*) The opposite side would always have the right to demand the inclusion of any evidence which it was proposed to omit, or to object to anything which it considered unfair about the précis. Thus, if during the examination-in-chief of a witness for the defence, the Defending Officer proposed to omit certain words used by the witness, the Prosecutor would have the right to insist that they should be recorded.

(*c*) The Court would, of course, have a similar right to demand the inclusion of any evidence which they considered important. It would, likewise, be for the Court to decide any dispute which might arise as to the words used by a witness or the meaning which ought to be attached to them.

(*d*) As at present, the written précis would be read over to the witness, and he would be required to approve or amend it before leaving the Court.

Certain details of this suggestion would, doubtless, require the opinion of legal experts, but so far as an unskilled layman can see, it does not conflict with anything in the present Manual of Military Law; and it does outline a scheme which would secure some economy of time, together with an increase rather than a decrease of the safeguards which are necessary in the interests of justice.

A SUGGESTED DRILL FOR ARMOURED FORMATIONS

By Captain W. T. Sargeaunt, *p.s.c.*,
Royal Tank Corps.

" Drill . . . enables troops to be brought face to face with the enemy in the formations considered most suitable to the occasion." (*Cavalry Training, Vol.* I, 1924, *Sec.* 147.)

" Proficiency in the handling of guns and equipment is the principal object of the artilleryman's training . . . Drill is the basis of the training." (*Artillery Training, Vol.* I, 1924, *Sec.* 3.)

I. The Object of Drill.

HISTORICALLY, drill started as an ordinary method of performing military acts in the face of an enemy. It was soon found that it also produced that habit in the soldier which the manuals call " the ingrained habit of cheerful and unhesitating obedience," in other words, discipline.

But the difficulty is that as the fashions of arms change, so must the drill change if it is to be of use on the battlefield, while a drill which has ceased to be of use in the face of the enemy may still be considered useful for the inculcation of discipline. Thus, for instance, infantry battalion drill, originally a live thing, a manœuvre in face of an enemy, has long lost that significance, and has become merely a method of teaching discipline. Cavalry drill, on the other hand, still retains its old purpose.

It appears that a drill for Armoured Fighting Vehicles must fulfil two conditions. First, it must enable vehicles to be brought on to the battlefield and manœuvred there in the formations most suitable to the occasion ; secondly, it must ensure that the crews are proficient in the handling of their armament and in its employment against the enemy.

Drill ought, therefore, to be divided into three categories :—Crew Drill, which consists of the detailed duties of the men in handling the vehicle and its armament ; Dismounted Drill, the main object of which is the training of men on foot in mounted drill ; lastly, Mounted Drill, which leads up to manœuvre in formation in face of the enemy. A drill for moving dismounted parties about the barracks can be fitted

into the framework of dismounted drill; mounted drill, with slight modifications, will be suitable for ceremonial.

II. Fighting Formations of Armoured Fighting Vehicles.

Dismounted Drill, therefore, should be the same as Mounted Drill. The details of Crew Drill and Ceremonial are only of domestic interest, and will not be considered further. Fighting formations for tanks, however, do present certain problems of general interest.

A creature that fires while it moves is a new feature in land warfare. There is no complete analogy. It has been suggested from time to time that our drill should be based either on that of artillery, of cavalry or of ships. But there are essential differences. Battery Drill is designed to get the guns quickly into positions from which they can fire. Cavalry Mounted Drill is designed to manœuvre for the charge. Both, of course, make the fullest use of concealment offered by the ground, and to that extent they are useful guides. But the essential difference is this. Both these drills lead up to a fighting formation—in one case a line of firing guns, in the other a line of charging horsemen. The objects are to bring up the guns under cover and to prepare the charge unseen. Therefore, the greatest flexibility is possible. Guns can cross each other, bodies of cavalry can mask each other. But we cannot do this, because all our manœuvres are fire manœuvres; we are always a line of battle. We get this analogy from ships. But they have not, as we have, to use ground infinite in variety. Their dispositions can be freely taken upon the pathless sea. In our manœuvre, therefore, we have to combine the naval conception of formations, as producers of fire, with the purely land conception of formations adapted to the ground.

The first formation proposed is Line Ahead. This is suitable for advance on a narrow front, and also gives the greatest possible broadside fire. Line Ahead is the main naval fighting formation. It cannot be so for us. Naval writers, Mahan for instance, point out that a fight in Line Ahead is liable to be an indecisive fight. On the "Glorious First of June," the French in Line Ahead endeavoured to avoid a decisive engagement. Howe turned into Line Abreast and forced it on them. For us, therefore, Line Abreast, which we call Line, is also necessary, since we must close the enemy. For this reason the designers of tanks are now more and more concentrating on giving us the maximum of fire to the front rather than abeam.

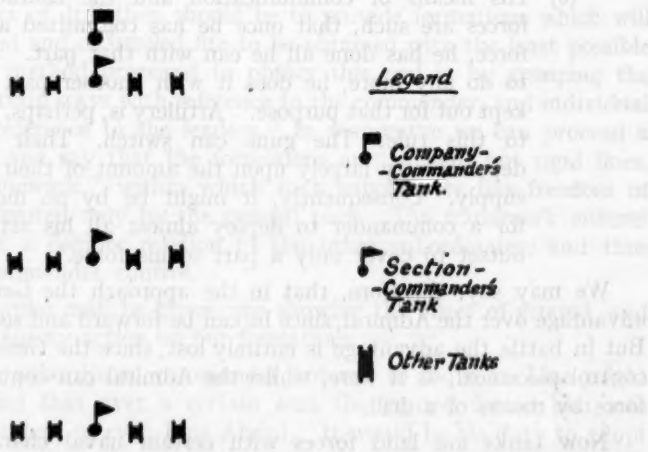
Having decided upon these two basic formations, the next question is how to change from one to the other. To maintain direction and leadership it is necessary to adopt the cavalry method of increasing front, that is to say, the leader maintains his direction and the units move outwards and come up into line with him.

To take an example. A company moving in Line Ahead wishes to form Line. The signal being given, the two rear section commanders lead their sections outwards, still in Line Ahead, to deploying distance until their heads are level with the head of the leading section.

This formation is thus obtained :—

Cavalry would call this Line of Section Columns, but owing to the limits of wireless telephony this is too long a description for us. It is, therefore, necessary to coin a new word. The name Trident is suggested as suitable. To complete the movement each section forms Line on its leader.

An alternative method of deployment is for each section first to form Line on its own leader. A Column formation is thus obtained :—



To complete the movement the rear sections incline outwards and come into Line.

We thus have the basis of a drill, consisting of four of the simplest possible formations. These formations are the same, whether a company, battalion or a brigade is drilling. The method of changing from one to another is for the leaders to keep direction, and the remainder to manœuvre round them.

It now becomes necessary to consider two further points :—the position of the commander and subordinate leaders and the application of this drill to manœuvre.

III. The Position of the Commander.

The accepted theory of land warfare is that a commander influences the fight by the issue of orders and by the use of his reserve. To do either he requires information. Therefore, he is normally well forward in the approach, and when battle is joined he watches from the rear until the time comes for him to intervene. Compare this with the naval theory. There the commander gets his information from light craft and from the air. On this information he deploys the whole of his forces, probably on a pre-arranged drill. He is in the midst of the battle aboard one of the most powerful units of the fleet. The whole fleet manœuvres to his command. These differences arise from essential differences in the conditions :—

(*a*) On land the commander cannot move freely about the battle-field, owing to small arms fire ;

(*b*) His means of communication and the character of land forces are such, that once he has committed a part of his force, he has done all he can with that part. If he desires to do any more, he does it with another part of his force kept out for that purpose. Artillery is, perhaps, an exception to this rule. The guns can switch. Their effectiveness depends very largely upon the amount of their ammunition supply. Consequently, it might be by no means unusual for a commander to deploy almost all his artillery at the outset to cover only a part of his force.

We may say, therefore, that in the approach the General has an advantage over the Admiral, since he can be forward and see for himself. But in battle the advantage is entirely lost, since the General can only control piecemeal, as it were, whilst the Admiral can control his whole force by means of a drill.

Now tanks are land forces with certain naval characteristics in addition. It seems possible for them to combine the advantages of both systems. The commander should, therefore, go forward with his

light forces during the approach march—probably in an armoured car. When the battle is joined, he should resume his place in his tank, which is part of the formation, deploy the formation by drill, and manœuvre them by drill signals.

It may be objected that—except in the case of a fight between two armoured forces—a tank formation will almost certainly have to operate piecemeal against a series of ground objectives. The question of deploying the whole force, therefore, does not arise. But in such a case each part of the tank force which is allotted to a separate objective becomes a detachment for that particular operation, and the rules apply absolutely to the commander of the detachment.

There is an ancient discussion, still not dead,[1] as to whether the admiral should be at the head or in the centre. In the case of tank units, so long as the signals are visual signals, it is probably necessary for the commander to lead. But the essential point is that all commanders, from the highest downwards, must so place themselves that their signals can be picked up. When R/T comes into general use it would be possible for them to be in any part of the line. In the case of the more subordinate leaders, however, a position from which their tanks can lead, actually and physically, gives a moral advantage more than outweighing the added danger to this position.

IV. Application of Formation to Manœuvre. (The "Framework".)

The object of drill then should be to provide formations which will enable massed and controlled fire to be obtained with the least possible delay. The method proposed to obtain this end is by grouping the leaders in certain ways with reference to the commander, and individual tanks with reference to the leaders. In manœuvre we can proceed a step further and say that the formations are, in fact, not rigid lines, but a "Framework," within which each subordinate has freedom of manœuvre, limited only by the general plan. The framework ensures that he is in a definite relation to the other subordinates, and thus gives the commander control.

Two examples may be given, one showing the effect of ground, and the other of enemy action on our formations :—

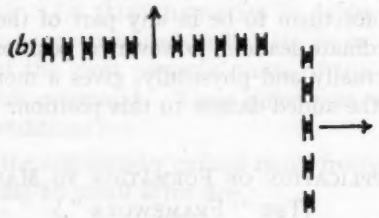
(*a*) A subordinate commander ordered to move in Line might find that over a certain area the ground forced him into Trident or even Line Ahead. It would be his duty to adopt

[1] See R.U.S.I. Journal, August, 1929, page 557, where Mahan is quoted on this matter.

such formations, getting back into Line as soon as he possibly could.

(*b*) Every subordinate commander has, of course, at all times to keep in mind the probable direction of the further deployment, in other words where he will have eventually to get into a fire formation. The presence and action of the enemy will, in many cases, make this tolerably clear. For example: A company moving in Line is attacked from the right flank. It is the duty of the right flank section to form Line Ahead to deal with the situation, thus:—

Then becomes



The arrows being the direction of fire.

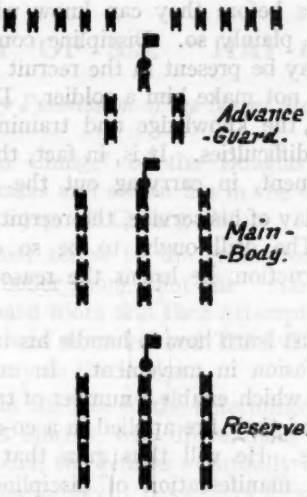
The above formation is very similar to the "ordre mixte" of the old drill books.

V. Formations Applied to Grand Tactics.

The division of armies into three bodies has persisted with different names throughout the ages. In the Roman epoch they were principes, hastati, triarii. In medieval war they were the van, the battle and the rear.

Modern thought on armoured formations seems to be tending in a similar direction; we are speaking of a light group, medium group and support group. There is no space to deal with this matter fully here. It will be sufficient to say that, although the proposed drill is primarily designed to allow a unit armed with weapons all of one kind to be manœuvred, and to apply its fire as a unit, nevertheless a commander can advance with his advanced guard, his main body and his reserve properly disposed on the ground, all within the framework of this drill.

For example, a Battalion in tactical column might advance (diagrammatically) thus :—



When we know more about armoured formations we shall, no doubt, find that a form of signal book will be necessary, laying down appropriate manœuvres for various occasions and means of carrying them out. For example, if a commander advancing in Trident can half-wheel the heads of his three sub-units—
this formation

becomes

Thus giving a very effective flanking fire as shown by arrows.

VI. Discipline.

A well-known writer[1] has remarked that armoured formations must decide on their tactics before they can know what sort of discipline they require. This is plainly so. Discipline consists not only in the will to obey. This may be present in the recruit on the square for the first time. That does not make him a soldier. Discipline consists also in the power to obey, the knowledge and training necessary to carry out orders in spite of difficulties. It is, in fact, the exercise of personal will, helped by judgment, in carrying out the orders of a superior.

So, from the first day of his service, the recruit should begin to learn discipline by drill. The drill ought to be so designed that, as he progresses in his instruction, he learns the reason for the movements he is being taught.

In crew drill he must learn how to handle his tank and its armament rapidly, without confusion in movement. In mounted drill he must learn those formations which enable a number of tanks to be manœuvred at speed in control, and their fire applied in a co-ordinated manner in a rapidly moving battle. He will thus gain that reasoning obedience, which is the highest manifestation of discipline, and alone renders possible co-ordination of effort from a number of complex and rapidly-moving weapons, and the development of their full fire effect in war.

[1] Colonel J. F. C. Fuller; "British Light Infantry."

PIRACY OF S.S. "HAI CHING"

(By Permission of the Naval Staff).

THE S.S. "Hai Ching," of the Douglas Steamship Co., was attacked by pirates and set on fire in the early hours of Sunday, 8th December, 1929, off Chilang Point.

The pirates obtained access to the grille-protected area through a coal bunker and the boiler room, shot the "stand-off" Indian guards while asleep in the guard room and then attempted to rush the bridge. Chief Officer R. Perry was wounded and Third Officer A. K. Woodward killed while on their way to the bridge.

Getting desperate in the face of the determined resistance of Captain O. H. Farrow and his officers, who drove them aft and held them at bay for some three hours, the pirates eventually endeavoured to escape in the ships boats, using innocent passengers as a screen, but the firing of the ships officers prevented their lowering the boats.

The destroyers "Sterling" and "Sirdar," which were on patrol, received the S.O.S. about 5.15 a.m., and reached the "Hai Ching" at 6.30 a.m. The ship was found stopped and seriously on fire; the pirates being aft, scattered and mixed with the passengers. A boarding party was sent on board, and the "Sterling" took the ship in tow, whilst the "Sirdar" lay alongside. About 350 Chinese passengers were removed to the destroyers. The European passengers, one man and five women, were unharmed, and did good work among the wounded. The fire was got under control by 11.0 a.m., and at noon the ship proceeded under her own steam, using hand steering. She reached Hongkong under escort of the destroyers at 6.0 p.m.

The estimated death roll on board the "Hai Ching," including some passengers lost through boat accidents at davits during the night, was about thirty. The "Hai Ching's" bridge and midship superstructure were completely gutted, and between decks, amidships, she was badly burned. The "Sirdar" received minor damage whilst alongside.

The following is an extract from an account compiled by an officer in H.M.S. "Sterling."

NARRATIVE.

As far as can be ascertained, the trouble began at about 1.0 a.m. on Sunday, 8th December, 1929, when the second officer was on watch

on the bridge and the third engineer on watch in the engine room. The remainder of the officers and the captain were in their cabins.

The captain had been called by the quartermaster and told there was a thief on board. He turned out immediately, dressed without switching on his lights and went out on to the boat deck. Hearing a shot from below, he immediately went across to the starboard side of the boat deck and looked down through the grating, which ran fore and aft over the starboard alleyway, when he heard a scuffle in the guard room. Realising that it was almost certainly an outbreak by pirates, he rushed straight up to the bridge, where he found the second officer, quartermaster and two Indian guards; one guard had been on duty at the foot of the bridge ladder on the boat deck, and the other was supposed to have been on duty in the starboard alleyway. Almost as soon as he reached the bridge some pirates started to rush the bridge ladders but were driven back.

Just then the chief officer and the second engineer arrived on the bridge, the latter being wounded, but having killed his assailant on the bridge ladder. The chief engineer had been awakened by shots. He got up, and looking out of his door saw several pirates about half way along the port alleyway. He quietly closed his door, switched out his lights, put some clothes on and waited his opportunity to slip out and reach the bridge.

The officers on the bridge now turned their attention to covering the fore well deck, in order to allow the officers from the forward cabins to reach the bridge. The third officer ran out in his pyjamas and was shot as he reached the bridge ladder by a pirate in one of the alleyways. The second engineer was slightly wounded in the same way. Both, however, reached the bridge, though the third officer collapsed almost as soon as he arrived. The pirate who shot the third officer also shot and wounded the chief officer.

About this time the captain sent down for the third engineer. He did not come up for some time, and the captain became rather anxious about him. The third engineer was, as a matter of fact, being held up in the engine room by four pirates, who forced him to stop the main engines and dynamo and asked him for kerosene. The latter he refused to give them, so they knocked the lock off the kerosene tank, took what they required and burned the remainder, of which luckily there was not very much left in the tank. They also burned the dynamo and went round the engine room breaking, for no apparent reason, such things as thermometers. The third engineer said that the pirates were very excited and shaking with fear. They then pushed him up the engine room ladder at the point of a gun, and took him along the

starboard alleyway towards the bridge. When about half way along the alleyway he knocked out the leading pirate and ran for the bridge, which he succeeded in reaching unscathed.

When all the officers had arrived on the bridge the captain sent the quartermaster down to the chart house (which was below the bridge), to get the Winchester rifles and ammunition from the cupboard there. Up to this time they had all been firing pistols. The quartermaster did not return, so the captain went down himself to get the rifles and ammunition. He found the quartermaster hiding in his bathroom. The key of the cupboard was missing, so the captain broke the glass front with his hand, took the rifles and ammunition and went back to the bridge.

The pirates were armed with Browning automatics and one or two old Winchester rifles.

Meanwhile, the upper party of pirates were still trying to take the bridge, some of them getting on to the after end of the boat deck (one body was later found port side aft of the boat deck), and the remainder in the fore end of the alleyway, trying to get out on to the fore well deck and so up to the bridge. By the time the party from the engine room arrived with the kerosene the pirates realised that their chances of taking the bridge by ordinary methods were very small, as two officers were stationed each side of the bridge, shining their torches down over the alleyway entrances and shooting the pirates down every time they appeared. They therefore threw the kerosene about and set fire to the bridge and foremost ends of each alleyway. Having done this they renewed their attacks from all round, but more especially from the boat deck. The captain saw someone climbing up over the guard rails on to the boat deck abreast the bridge. He switched on his torch and fired, the body falling overboard.

The officers held the bridge for some time until the fire got such a hold that it was no use remaining there. They then started to move aft along the boat deck, taking with them the third officer's body. As they moved aft the bos'un saw some pirates moving about in the starboard after end of the boat deck. Fire was opened and the pirates driven back. About this time the captain started hailing the European passengers with the idea of getting them inside the grille. There was no response, so he sent his boy down to find them. The boy returned and said he could see no sign of them. The captain then went himself to see if he could see them, but no trace of them was found until much later. The Europeans said afterwards that they locked themselves in their cabins. The captain then let several of the stewards into the grille, making them climb round at the after end.

The pirates' next move was to man the starboard poop lifeboat and open fire on the boat deck from there, making great use of electric torches while in the boat by showing them towards the boat deck and trying to pick off the officers. The officers took cover behind the water tanks and grille armour and returned the fire, at first with caution, as the captain was afraid that passengers might be mixed up with the pirates. Eventually the pirates were driven out of the starboard boat and rushed across the poop into the port boat, where the same thing took place. They left the port boat, and a little later firing started from the well deck. The captain shot at them now with a 12-bore gun, using 3½ shot ; perhaps he thought that it would do less damage or he may have run out of other ammunition.

By about 3.0 a.m. the pirates seemed to give up ; whether they were ransacking the passengers is unknown, at any rate they were not in evidence on the upper deck. The passengers rushed up to the port poop boat, manned it in great numbers and tried to lower it. They could not get the after fall clear, and let the foremost fall go with a run, tipping all the passengers into the sea and on to the gangway ladder.

The fire hoses, which were stowed under the bridge, were all destroyed in the fire, so the officers tried to keep the fire back by using buckets of water ; the buckets were still hanging over the side on heaving lines when the " Sterling " arrived. The fire, however, had obtained such a good hold and the heat was so fierce that the captain decided that the crew should abandon the ship and lie off in the lifeboats. This was done, and two rafts were also lowered from the boat deck. The boats picked up many people from the sea and stood by near the ship. A fishing junk which was in the vicinity sent a sampan over, and took off about four boatloads, remaining by the ship until the destroyers came to the rescue. There were a few other junks in the vicinity, but they would not pay any attention, and would not even pick up drowning people. The captain of the " Hai Ching " remained on board his ship, and tried to keep the fire back, keeping watch from the starboard after end of the boat deck.

About 4.0 a.m. the ships boats were still lying off, and, as everything seemed to be fairly quiet with the exception of the alarmed passengers, the captain decided to get the W/T operator back. This he did, first of all getting a seaman on board up a rope's end, and then together they hauled the W/T operator on board. The W/T operator, on returning on board, found that his aerial lead was down and touching the trunking, so he made the S.O.S. on his secondary set.

On arrival of the " Sterling " at about 6.0 a.m., the general appearance of the " Hai Ching " was as follows :—

The fire was still burning, forward. The bridge had completely collapsed. The starboard accommodation ladder was hanging judas by the ladder fall. The port accommodation ladder was lowered, and had one very badly wounded man lying on it near the bottom. The port poop lifeboat was hanging by the after fall, the bows of the boat just clearing the accommodation ladder. One man was sitting on the rudder, which was jammed right over—helm hard a starboard. One man was floating astern of the ship, drowned, with the log line made fast around him. The decks aft were crowded with deck passengers and all their belongings, some of the packages having broken open and their contents lying all over the decks. The ship had a slight list to port. The circulator was still running. All four midship boats falls were over the side. One life raft was lying alongside the starboard side amidships. One lifeboat was lying just abaft the raft on the starboard side, made fast with the painter. Three lifeboats, containing the crew and officers, were lying off. Three junks were close to the ship, the nearest: the one which had taken off some of the crew, being within about three cables. The captain stated that this was as near as the junks had been to the ship during the piracy.

Eight dead were found as follows :—

In guard room	1 Indian guard (shot).
Port boat deck aft ..	1 Chinese male (shot).
Port accommodation ladder	1 Chinese male (died when brought up ladder).
Starboard poop lifeboat ..	1 Chinese woman (shot). 1 Chinese male (shot).
Port poop lifeboat.. ..	1 Chinese male (shot).
Right aft on poop.. ..	1 Chinese boy (shot).
Floating astern on logline..	1 Chinese male (drowned).

The wounded were found in various parts of the ship, but a large percentage of them were aft. There were two in the saloon, and the remainder were collected in by boarding parties, with the exception of those who had gone on board the "Sterling" from lifeboats, and some who were in the junk, and who were eventually taken on board the "Sirdar." An Indian guard who was wounded very badly in his bed in the guard room was found outside the saloon door. He was shot in three places. A wounded Chinese male who was found in the guard room was identified by the third engineer as being one of the pirates who had held him up in the engine room. He was also identified by the wounded Indian guard as being the man who attacked the guards in the guard room, and whom he had hit over the head with a chopper blade or some similar instrument.

A very badly wounded Chinese girl was found with the dead woman in the starboard poop lifeboat. She was passed into the "Sirdar," together with some other wounded, but died there during the afternoon.

General Observations.

It appears that on a previous voyage shortly before this piracy, the police found some rifles and ammunition hidden in one of the "Hai Ching's" coal bunkers just as she was on the point of sailing North from Hongkong. They were under just enough coal for them to have been easily found by the time the ship reached Swatow. If this is correct, the firemen were almost certainly implicated in the piracy.

The organization of the pirates was undoubtedly bad from the start, and it seems probable that the leader was killed early on, as the organization went from bad to worse. The gang must have been about twenty strong at least, and if properly organized could not have failed to take the ship.

The starboard alleyway Indian guard was obviously not on his beat, so that the pirates were free to attack the wireless operator and guard room while the boat deck party was shooting the Indian guard and rushing the bridge. One pirate in each alleyway could have accounted for the four officers asleep, as they came out of their cabins. The engine room could either have been attacked simultaneously or later. The piracy was really doomed from the moment the first shots were fired in the guard room, because the actual attack did not develop until quite an appreciable period afterwards, by which time the defence was ready; the officer of the watch had time to call the captain; the captain had time to dress, go out on to the boat deck and look down into the guard room, go back to his cabin for his pistol, and then up to the bridge, arriving there before any attack had been made on the bridge.

It is highly probable that either some portion of the gang mistook their orders and lost their way, or else that some internal aid which the pirates had counted on failed them at the last moment.

A CENSUS OF REGIMENTAL COLOURS

By Captain H. Bullock, F.R. Hist. S., I.A.

In both England and India, countries of which I can speak from personal knowledge, there are old regimental colours and standards in a large number of churches, museums and other public institutions, as well as in private hands. I make no doubt that the position in Canada and other parts of the Empire is the same; and I have seen British colours in the *Invalides* in Paris, and know of others in Buenos Aires, Khatmandu and West Point. On inquiring about certain of these flags, I have more than once found that the authorities in whose keeping they had been placed could give no information, and that in many instances nothing could now be ascertained as to the regiments by which they were carried. I also learnt of colours given to churches, but hidden away instead of being displayed, and of others which after a period of display have been taken down, to vanish. At the same time, certain colours came to my notice, the existence of which was unsuspected by the regiments to which they had belonged.

These instances of apathy or ignorance, together with others which considerations of space prevent my setting forth here, led me to consider whether such a state of affairs might not be remedied or at least mitigated. It was immediately evident that no scheme could be feasible which entailed any semblance of encroachment upon the authorities to whom old colours have been entrusted for perpetual keeping; and my conclusion, which I venture to present for what it is worth is that the first step to be taken, in the interests of regiments and of all interested in military history and traditions, is the compilation of a census of regimental colours and standards. No sooner had I reached this conclusion than I found that I had been anticipated in my scheme. Encouraged by this independent support, I have tried to work out the project in detail, with the hope that others will offer any suggestions that occur.

(a) *Scope.*—The aim of the scheme can, I conceive, be nothing less than to record in printed form the present location of all colours not in regimental keeping, to facilitate research into military history in general and regimental history in particular. To the bare record of places and regiments there might suitably be added notes on colours peculiarly interesting from the historical or technical aspects, together with occasional illustrations, and any information of special interest arising from the work of compilation.

(B) *Method.*—The information would be collected and collated by a small central committee from county and other local voluntary workers. Index cards would probably be the most convenient method of recording information, with spaces for entering :—

TOWN ;
Church ;
Museum, etc. ;
Regiment ;
Period of the Colours (if ascertainable) ;
Date laid up ;
Condition ;

and any other useful details. These cards would be separately cross-indexed by regiments.

From these would be compiled a printed list of colours, classified under various appropriate headings, such as :—

Regular Cavalry Standards ;
Yeomanry, etc. ;
Foot Guards and Regular Line Battalions ;
Service Battalions, 1914–18 ;
Territorial Army ;
Militia and Fencibles ;
Indian Army ;
Dominion and Colonial Forces.

This printed list might, perhaps, be first published in quarterly parts with a cumulative index to regiments, with a view to eventual consolidation in book form, should financial considerations permit. One might reasonably expect every regular regiment to subscribe to the quarterly parts, I think, provided the price were kept down to a minimum; while support from individuals and from units of the auxiliary forces might also be looked for. I do not envisage the annual subscription as being more than about 10/- a year.

(C) *Other Considerations.*—Support from the Press in the initial stages of the scheme would be of great value ; and such periodicals as *Notes and Queries* and the *Journal of the Society for Army Historical Research* might with confidence be expected to render valuable assistance. Much would be expected, too, from the three or four persons in England who have a large special knowledge of regimental colours ; and there are two books—one privately printed many years ago in a very limited edition and one just written and as yet unpublished—which should be sources of considerable importance.

Note.—The EDITOR of the JOURNAL would be glad to hear from any readers interested in this scheme.

SCHEMES ON THE SAND-TABLE

By Captain E. I. Glasbrook Richards, B.A.,
Army Educational Corps.

A SAND-TABLE is an excellent instrument for imparting simple tactical lessons. It is handy; its terrain can be varied to suit different situations; and the points of attack or defence can be clearly demonstrated and at leisure. Nevertheless, the ordinary sand-table has certain disadvantages which detract seriously from its utility. To start with, it is a picture of a Sahara, a barren unpeopled waste of sand, and yet, in normal European country, half the tactical use of ground consists of the skilful utilization of woods, hedges, villages and roads, none of which are displayed on the usual sand-table.

Occasional efforts, it is true, are made to render things more realistic by the use of bushes, trees or hedges, usually carried out in green-dyed loofah with blocks of wood to represent houses. But there matters begin to go hopelessly out of joint. For scale is so seldom realised. Trees tower 400 feet into the air, while cottages are as large as the Hotel Cecil. As an example, I once saw an officer conscientiously demonstrating a platoon attack with lead soldiers. The scheme, which involved co-operation with adjacent platoons, was intended to cover a space of about seven hundred and fifty yards by five hundred. But on the scale of the toy soldiers—2 in. high—and on the scale of the sand-table—6 ft. by 4 ft.—the whole battle was staged within a rectangle 72 yds. by 48 yds., that is less than the size of an ordinary football field.

Now, the sand-table that is required is one which shall be a model representing with absolute accuracy an actual piece of country down to every detail, from the village street to the hedges, streams and woods, from the colour of the fields to the gradients of the roads. It must be on a scale large enough to show such detail properly, yet small enough to include sufficient ground for a battalion in attack or defence. That, in brief, is the sand-model to be aimed at.

Some time ago, when teaching some senior N.C.O.'s map-reading for their first-class Certificates of Education, I discovered an enormous disused sand-table—about 12 ft. by 6 ft.—which I found quite useful

for my purpose. Then one day the Brigade-Major enquired of me if I could make a model of some country over which his brigade was to make an attack in conjunction with a Territorial Brigade. The actual ground was, unfortunately, rather inaccessible. So the class set to and, after trials and errors, as well as much handling of the ton or so of sand that the portentous table held, a fairly accurate model of the country was produced. It was an imperfect thing compared with our later models. For one thing, we made the vertical scale twice the horizontal, which we found afterwards was quite unnecessary. Yet it proved, for its purpose, ideal. The whole scheme was worked out, and discussions were held after the action; in short, it was an unqualified success. It sufficed, on its scale of 1/1,200, for a Brigade attack on a two-battalion front, the area of ground covered being 4,800 by 2,400 yards. Since then I have supervised several other exercises of a like nature and found them exceedingly valuable.

The Uses of the Improved Sand-Model.

The uses of a perfect miniature of a piece of actual country are obvious. Schemes can be worked out far more easily than by proceeding to the ground, yet with considerable approximation to truth. The scale adopted, 1/1,200, for the average sand-table 6 ft. by 4 ft. represents an area 2,400 by 1,600 yards to be covered; this is large enough for most battalion schemes. The eye at 30 in. above the table—an ordinary height from which a man standing up looks down on a table—is in the exact position of an observer flying in an aeroplane at a reconnaissance height of 3,000 ft. Peering close to the model one is at a height of 500 ft., which is near enough to estimate whether one point is invisible from another.

It may seem a bold assumption, that a model 6 ft. by 4 ft. should be as valuable for all exercises without troops as a piece of ground covering nearly one-and-a-half square miles. Yet this is an understatement rather than an over-estimate of fact, for the improved sand-model can, indeed, be more useful than an actual piece of country for such exercises. It can be viewed from any angle or any height; it can be reconnoitred in all weathers, at all times, and may be used by night as well as by day. This would render it invaluable in bad weather, or where training ground is inaccessible. For Territorial battalions situated in urban districts the model should be particularly useful, inasmuch as it can be used by artificial light.

To effect its purpose the following are a few conditions which our improved sand-table must satisfy:—

(1) It must be capable of being constructed on existing sand-tables;

(2) The materials must be easily procurable and inexpensive;

(3) It must be capable of construction under the supervision of any average officer;

(4) It must not take too much time in the making;

(5) It must be possible to dismantle and reconstruct it as a different piece of country.

As to these conditions :—

(1) The sand-model can be constructed on any sand-table, with upright sides, of whatever size;

(2) The materials can be obtained anywhere in England or India: exclusive of sand they cost a very few shillings;

(3) It can be constructed by anyone with a fair knowledge of map-reading, provided he is careful and, above all, accurate;

(4) (This is the most difficult condition). It cannot be denied that the meticulous copying of a square mile of country takes time. It is too much for one man. He must have at least six or even twelve intelligent assistants. But, incidentally, it will give the latter, who should be N.C.O.'s, a really invaluable lesson in map-reading. Six men at the first attempt make a model in eight hours; at the second attempt far quicker. This time is exclusive of that spent in making model trees, houses, etc. It might be added that making of a model may be regarded as a rather fascinating exercise.

(5) It can be easily dismantled. In fact it should be a rule to dismantle and remake it frequently. Unless this is done the model grows too stale and familiar.

The Making of the Model.[1]

(1) *Scale of the Model.*—The enlargement must be made to scale of actual linear measure. The ideal scale is 1/1,200, a fraction large enough to show detail yet small enough to include sufficient extent of country on the average sand-table. So the scale works out at :—

1 yd. on the sand-table = 1,200 yds. on country;
1 ft. „ „ = 400 yds. „
1 in. „ „ = 100 ft. „
100-ft. contours will be 1 in. high.

[1] These directions have been given in some detail, so as to avoid any possible misunderstanding. Actually the making of hill-features, which sounds very elaborate on paper, could be demonstrated in less than one minute on the table.

Now for some common objects :—

An average road is $\frac{1}{4}$-in. wide on the model ;
" " cottage is $\frac{1}{4}$-in. high " "
" " house is $\frac{5}{16}$-in. high by $\frac{1}{4}$-in. wide and $\frac{5}{16}$-in. thick on the model.
" " tree is $\frac{1}{2}$-in. high on the model ;
" " bush is $\frac{1}{8}$-in. " " "
" " hedge is $\frac{1}{16}$-in. high on the model ;
The height of a man is $\frac{1}{16}$-in. high on the model.

These measurements, in which accuracy is all important, will become quite easy to maintain. In fact, one can work even finer without difficulty, but $\frac{1}{16}$-in. to 6 ft. is about the practical unit for accuracy.

(2) *How to start.*—The process is essentially to make a simple map-enlargement, but in three dimensions instead of two.

First, select a piece of country to be enlarged ; any varied bit of ground will do. The contours should range from 100–600 or 200–700 ft. ; otherwise if there is a wider range of contour the sides of the sand-table will need be more than the usual 6 in. high.[1]

Secondly, make a map-enlargement on paper, square the map, and then make proportionate squares on the table. Divide the map into 400 yard squares by protractor, and the sand-table into 400 yard squares by means of string (Diagram 1).

Thirdly, make each member of the class draw an enlargement of the ground selected on a scale of 6 in. to the mile, putting in all relevant detail from a 1/20,000 map or an eye sketch, if this is possible. Allot each of your six so many squares on the sand-model, say four all adjacent ; each member of the class is responsible for the construction of his own four squares on the sand-model.

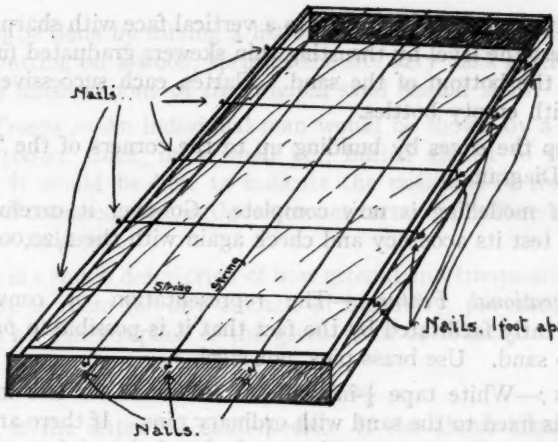
(3) *Modelling the Ground.*—(*a*) Work with slightly damped sand ; start with an even level of sand, say $\frac{1}{2}$-in. deep over the table—this will be the lowest level.

(*b*) On this the class will mark out, with pointed sticks, the first contour; build up this contour to a height of 1 in. or 100 ft. (Diagram 2).

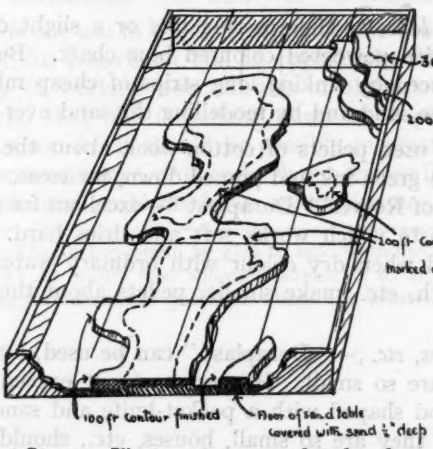
(*c*) Mark out the second contour and build this up likewise on top of the first.

At this point the contours will show like a series of diminishing slices of thick brown bread (Diagram 2). This is not difficult, for if the sand

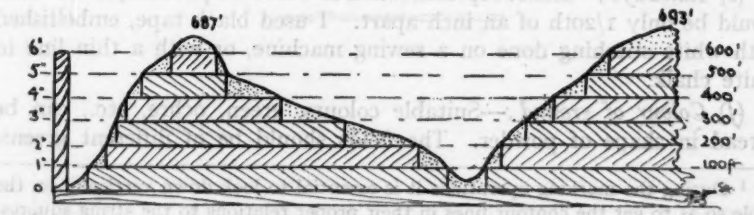
[1] The country selected will be in a proportion of 1/1,200 of the sand-table, i.e., a sand-table 7 ft. by 5 ft. = 2,800 by 2,000 yards, or 6 ft. by 4 ft. = 2,400 by 1,600 yards.



1—Sand Table divided into squares by means of string stretched over top.


300 ft contour marked out
200 ft contour finished
200 ft contour marked out.
100 ft contour finished
Floor of sand table covered with sand ½" deep

2—The First Stage.—First contour completed and second contour marked out. In top right-hand corner second contour completed and third marked out.



3—Section of part of Sand Table showing method of building up to the corners of "slices."

be damped, it can easily be worked to a vertical face with sharp corners. Constantly test the level by thrusting thin skewers graduated (in pencil) in inches to the bottom of the sand. Flatten each successive plateau by rolling with empty bottles.

(*d*) Fill up the edges by building up to the corners of the " slices " as shown in Diagram 3.

The relief modelling is now complete. Go over it carefully with 1-in. map to test its accuracy and check again with the 1/20,000 sketch or map.[1]

(4) *Conventional Features.*—The representation of conventional features is greatly facilitated by the fact that it is possible to *pin* things on the damp sand. Use brass pins, not steel.

(*a*) *Roads ;*—White tape ¼-in. wide or less wide for less important roads ; this is fixed to the sand with ordinary pins. If there are hedges they are represented by green wool, stretched and pinned down along the edges of the tape.

(*b*) *Rivers, streams, lakes ;*—Make a thin line or a slight depression in the sand, and fill with powdered coloured blue chalk. But a more realistic effect is produced by sinking long strips of cheap mirror-glass (or even tinfoil) into the sand and by modelling the sand over the edge.

(*c*) *Woods, etc. ;*—I used pellets of cotton-wool, about the size of a small marble, dipped in green ink and pinned down, for trees. A better substitute is a 1-lb. tin of Reeves' " Duraplast "—excellent for all model-making, for it is a paste which works soft and dries hard. Work a pellet round a pin and when dry colour with ordinary water-colours ; for bushes, undergrowth, etc., make smaller pellets about the size of a pill.

(*d*) *Houses, Churches, etc. ;*—" Duraplast " can be used, but I prefer wood, as the models are so small. Houses must not exceed $\frac{3}{16}$-in. to $\frac{5}{16}$-in. high. Thin wood shaped with a pocket-knife and sand-paper is the best medium. As they are so small, houses, etc., should be stuck with liquid glue to a small piece of cardboard, painted green.

(*e*) *Railways ;*—Exact representation is almost impossible, as the lines would be only 1/20th of an inch apart. I used black tape, embellished with white stitching done on a sewing machine, or with a thin line in white chalk.

(*f*) *Colour of ground ;*—Suitable colours, green, ochre, etc., can be spread in shape of powder. The fields should be of different greens.

[1] During the marking operations it is essential to look down vertically on the table so as to get the contour lines in their proper relations to the string squares (Diagram 1).

This can be done by mixing a little brown or ochre with a single green. Before putting on a wood, sprinkle the site very dark green. When the model is finished none of the original sand should show.

(*g*) *Troops*;—An individual man would be shown by a bit of brown wire, 1/100-in. thick, or a small pin, buried almost to the head. In practice it would be best to indicate the positions of troops by little squares of coloured card, with one corner turned up; these can be moved about by tweezers.

Such is a rough description of how ground and troops are represented. But there is room for any amount of ingenuity, provided the finished model is an exact replica of the given piece of country.

Conclusion.

Such is the improved sand-model. If the above instructions seem complicated, let it be remembered that its entire construction is really easy and fascinating. The utility of the completed model is enormous.

There is one use to which it might be put which I am rather diffident to suggest, for I have not had an opportunity of testing it. This is the possibility of working out schemes of aircraft co-operation. If it be remembered that one is looking down on a piece of country from a height of 3,000 ft., it should be possible to practice scale-model ground signals, reconnaissance, or even work out lessons in interpreting aeroplane photographs and problems in air reconnaissance.

Note.—The author would be glad to hear from any officer applying the above instructions; he would also willingly advise as to any exercises carried out on such a table, or to answer questions about the construction of the model.

THE INTERNATIONAL SITUATION

THE LONDON NAVAL CONFERENCE

AFTER three months' negotiation a Treaty was signed—but has still to be ratified by each nation concerned—by the five Powers represented at the Naval Conference. But the most important Section (Part III), governing construction of cruisers, destroyers and submarines for the next six years, applies only to Britain, the United States and Japan.

THE SAFEGUARDING CLAUSE

Article 21 of the Treaty contains a safeguarding clause, whereby any one of the three Powers who have bound themselves to definite limitations may, on giving notice to the other two, increase their fleet if "the requirements of national security . . . are in the opinion of that Party materially affected by new construction of any Power other than those who have joined in Part III of this Treaty."

This clause is a matter of great importance to Britain, because the Treaty fails to impose any restrictions on France and Italy on numbers of warships, other than battleships and aircraft-carriers, while all other European Powers, except Germany, are free to increase their navies as much as they like.

CAPITAL SHIPS.

Britain, the United States and Japan have agreed not to build any new capital ships before 1936, prior to which date it is proposed to hold another Conference.

The following battleships are to be scrapped or rendered unfit for warlike service :—

Britain.—"Benbow," "Iron Duke," "Marlborough," "Emperor of India," and the battle-cruiser "Tiger."

U.S.A.—"Florida," "Utah," "Arkansas" or "Wyoming."

Japan.—"Hiyei."

But in each case one ship may be retained for training purposes; in the case of Britain the "Iron Duke" is specified.

This will reduce the respective battle fleets to 15, 15, and 9 ships each.

France and Italy, on the other hand, reserve the right to build additional ships from the replacement tonnage to which they would have been entitled under the Washington Treaty, but of which they have not at present availed themselves.[1]

CRUISERS

Cruisers are defined as " surface vessels of war, other than capital ships and aircraft-carriers, the standard displacement of which exceeds 1,850 tons, or with a gun above 5.1-inch calibre." They are divided into two classes :—

(*a*) Those carrying a gun above 6.1-inch.

(*b*) Those carrying a gun not above 6.1-inch.

The complex problem of relative cruiser strength, the rock on which the Geneva Conference split, has been solved by the United States and Japan being assigned cruiser tonnage which implies a considerable increase in that class, while the British Empire has reduced the number of cruisers, which it was officially stated were necessary before the Conference, from seventy to fifty.

The figures agreed to by the three Powers are :—

	British Empire.		*U.S.A.*		*Japan.*	
	Tons.	Units.	Tons.	Units.	Tons.	Units.
8-inch gun cruisers..	146,800	15	180,000	18	108,400	12
6-inch gun cruisers..	192,200	—	143,500	—	100,450	—

It will be noted that the Treaty allows the United States three more 10,000-ton cruisers than the British Empire, but the latter will be able to have a considerable numerical superiority in the 6-inch class. The United States have the option, however, to limit the number of their 10,000-ton cruisers to fifteen, and increase the number of their 6-inch cruisers up to a total of 189,000 tons. In any case, they undertake not to complete more than fifteen 8-inch cruisers before 1935.

If the United States determine to build the three additional ships, they will be laid down one in each of the years 1933, 1934 and 1935, and in that event Japan will be free to advance a claim at the 1935 Conference for an increase in 8-inch tonnage.

AIRCRAFT CARRIERS

The limitations governing aircraft-carriers remain the same as those laid down in the Washington Conference, viz. :—

[1] Neither of these two Powers has built any capital ships since the war. They were entitled to 35,000 new tonnage in each of the years 1927, 1929, 1931, under the Washington Treaty.

British Empire	135,000 tons
United States	135,000 ,,
Japan	81,000 ,,
France	60,000 ,,
Italy	60,000 ,,

In future, however, it has been agreed by the five Powers that the term " aircraft-carrier " shall include " any surface vessel of war, whatever its displacement, designed for the specific and exclusive purpose of carrying aircraft, and so constructed that aircraft can be launched therefrom and landed thereon."

The gun armament of all new carriers is limited to 6.1-inch calibre.

The effect of these rules is to bring the carrier of less than 10,000 tons and that of greater displacement into the same category.

DESTROYERS

A destroyer is defined as a " surface vessel of war, the standard displacement of which does not exceed 1,850 tons, and with a gun not above 5.1-inch calibre."

The agreement as regards destroyers is, again, limited to the three Powers. The figures are :—

British Empire	150,000 tons
United States	150,000 ,,
Japan	105,000 ,,

Of the agreed tonnage for the destroyer category, not more than 16 per cent. shall be vessels of over 1,500 tons displacement.

It is interesting to note that France, who is not a party to these restrictions, has no less than twenty-four flotilla leaders—built and building—of well over 2,000 tons, the majority of which are armed with 5.5-inch guns.

SUBMARINES

All five Powers have agreed that in future no submarine shall be built exceeding 2,000 tons or with a gun above 5.1-inch calibre ; but each may retain not more than three submarines, not exceeding 2,800 tons, and armed with guns not above 6.1-inch calibre. France may include in this number one unit, already launched,[1] of 2,880 tons, carrying 8-inch guns.

Existing submarines of not more than 2,000 tons displacement and armed with guns greater than 5.1-inch may be retained.

[1] The " Surcouf."

France and Italy have refused to limit the number of their submarines. The other three Powers have agreed to the following figures :—

British Empire	52,700 tons
United States	52,700 ,,
Japan	52,700 ,,

It may be noted that Japan claims " parity " in this class of warship with either of the other two navies.

REPLACEMENT

A vessel may not be replaced before it becomes " over-age." The " life " of a vessel is taken from the date of its completion, and vessels become " over-age " in accordance with the following rules :—

A surface vessel exceeding 3,000 tons, but not exceeding 10,000 tons :—

(i) If laid down before 1st January, 1920 ; 16 years.
(ii) If laid down after 31st December, 1919 ; 20 years.

A surface vessel not exceeding 3,000 tons :—

(i) If laid down before 1st January, 1921 ; 12 years.
(ii) If laid down after 31st December, 1920 ; 16 years.

Submarines :—13 years.

In the event of loss or accidental destruction a vessel may be immediately replaced.

Notwithstanding these rules, the British cruisers " Frobisher " and " Effingham " may be disposed of during 1936, but apart from the cruisers under construction on 1st April, 1930, the total replacement tonnage of British Commonwealth cruisers prior to 31st December, 1936, is not to exceed 91,000 tons.

Japan may replace the " Tama," the oldest of her 5,100-ton cruisers by new construction, to be completed during 1936. In addition to replacing destroyers becoming " over-age " before 31st December, 1936, Japan may lay down in each of the years 1935 and 1936 not more than 5,200 tons to replace vessels becoming " over-age " in 1938 and 1939. She may, also, anticipate replacement during the term of the present Treaty by laying down not more than 19,200 tons of submarine tonnage, of which not more than 12,000 tons must be completed by 31st December, 1936.

VESSELS EXEMPT FROM LIMITATION

Rules specifying vessels exempt from limitation will cover such classes as sloops, river-gunboats, minelayers and minesweepers under 2,000 tons and with a speed not exceeding 20 knots, despatch vessels and coastal motor boats.

SPECIAL VESSELS

Certain vessels, such as large minelayers, submarine and destroyer tenders, seaplane carriers and monitors, are classed as " special vessels." These may be retained, and their tonnage is not included in that which is subject to limitation.

SUBMARINE WARFARE

Part IV of the Treaty, which has been agreed to by the delegates of the five Powers, relates to rules for " humanizing " the use of submarines in war. It is really a milder repetition of the " Treaty to protect neutrals and non-combatants at sea in time of war," drawn up at the time of the Washington Treaty. The latter, although ratified by Britain, did not receive unanimous ratification.

The new Treaty compels a warship, whether surface or submarine, to place " passengers, crew and ship's papers " in a place of safety before sinking an enemy merchant ship or rendering it incapable of navigation. The ship's boats are not to be considered a place of safety unless, " in the existing sea and weather conditions, by the proximity of land, or the presence of another vessel which is in a position to take them on board."

The new rules do not propose to treat those who violate them, " whether or not . . . . under orders of a governmental superior," as pirates, as the Washington draft did.

Other Powers are invited to subscribe to this proposed addition to the code of International Law.

FRANCE AND ITALY

France and Italy both issued statements (too late for inclusion in the last JOURNAL), prior to the drafting of the Treaty. It was the adherence of these two Powers to these statements in their essentials which made a full Five Power Treaty impossible.

The proposals put forward by France were that she was ready to accept limitations which would enable the French fleet to be made up to the following strength by 31st December, 1936 :—

	Tons.
Capital ships coming under the Washington substitution rules	156,466
Capital ships not under the above	52,791
Cruisers of 10,000 tons	100,000
Old cruisers with guns over 6-inch	24,850
Light cruisers, destroyers, etc.	258,597
Aircraft-carriers	32,146
Submarines	99,629
Total	724,479

This represents a very considerable increase as compared with the French fleet of to-day, especially in 10,000-ton cruisers, light cruisers and destroyers.

The only condition on which France was disposed to reduce her demands was that she should be given definite guarantees by the other Powers of naval support in the Mediterranean in the event of war. Such guarantees were not forthcoming.

Italy's attitude may be summed up in the phrase which occurs in her Memorandum: "Italy is prepared, *a priori*, to accept as the limit for her armaments any figure, no matter how low, provided it be not exceeded by any other Continental European Power."

The effect of these two pronouncements has been to produce an impasse, so far as these two countries are concerned. Italy has taken immediate steps to increase her fleet (vide Navy Notes p. 428.)

The Conference has adjourned indefinitely to give the French and Italian Governments time for further mutual negotiation.

EFFECT OF THE CONFERENCE

The following figures showing the strength of the navies of the British Empire, United States and Japan before the War and in December, 1929, were furnished to members of Parliament by the First Lord, early in February of this year. It is of interest to compare them with the tonnage which will be allowed in each class of ship under the London agreement.:—

COMPARISON (IN TONNAGE) OF THE THREE NAVIES— PRE-WAR; TO-DAY; AS ALLOWED POST CONFERENCE.

	British Empire.			U.S.A.			Japan.		
	Aug., 1914.	*Dec.*, 1929.	*Post Conference.*	*Aug.*, 1914.	*Dec.*, 1929.	*Post Conference.*	*Aug.*, 1914.	*Dec.*, 1929.	*Post Conference.*
	(*a*)	(*b*)	(*e*)		(*b*)			(*b*)	(*e*)
Battleships ...	1,200,535	556,350	427,850	529,796	525,850	456,200	260,480	301,320	273,820
Cruisers	770,750	327,111	339,000	272,244	106,001	323,500	235,365	232,855	208,850
Aircraft Carriers (*c*)	—	115,350	135,000	—	76,286	135,000	—	61,270	81,000
Destroyers (*d*) ...	144,753	157,585	150,000	35,099	307,155	150,000	20,334	110,395	105,000
Torpedo Boats ...	17,906	—	—	3,223	—	—	3,539	—	—
Submarines ...	26,382	45,534	52,700	8,041	80,700	52,700	2,364	66,068	52,700

(*a*) "Navy List" displacements.

(*b*) "Standard" displacements, except for capital ships which are in "Navy List" displacement.

(*c*) Excluding seaplane carriers.

(*d*) Including flotilla leaders.

(*e*) Includes battle cruisers in the case of Britain and Japan.

ANGLO-GERMAN RELATIONS

By Major E. W. Polson Newman, B.A., F.R.G.S.

EVEN a year before the evacuation of the Rhineland by British troops, there was noticeable in Berlin a friendly feeling towards England, which is free to develop now that the "occupation" bogey has been removed, and which has been stimulated by certain circumstances and acts of policy. Moreover, Locarno has recently assumed a new complexion with regard to Germany, and there is no longer the same necessity for her to seek the friendship of Russia in order to avoid isolation.

A good impression was created in Germany at the beginning of last year by the frankness of the British Embassy towards the German Government over the Anglo-French naval compromise: a move incurring great responsibility, which was amply justified in view of the importance of the question at the time. This open attitude with the Germans, together with the praiseworthy conduct of the Army of Occupation on the Rhine, has earned for Britain a reputation for integrity and justice. The Germans began to look in our direction to secure fair play in international affairs; they did not look in vain.

Whereas before the first Hague Conference there was a strong feeling in Germany that Locarno was a one-sided affair, from which Germany derived no benefit, things have moved rapidly in the last few months to show that Great Britain intends to support Locarno with regard to Germany as well as with regard to France. Not only has Britain taken the lead in the evacuation of the Rhineland, and thereby discouraged France remaining, but she also demanded justice for Germany in the Reparations Settlement that went to form the Young Plan. Even the Nationalist paper, *Kreuz Zeitung*, referred to Mr. Henderson's offer to Herr Stresemann to evacuate the Rhineland, independent of France, before the end of 1929, as a "really friendly act"; and Mr. Snowden's insistence at the Hague that there should be no settlement of differences between creditor nations at the expense of Germany has been added to the credit of Great Britain. While it is too much to expect actual gratitude for this, there certainly is, in Germany to-day, a deep sense of appreciation, although it is temporarily obscured by internal economic matters. The Germans also realise that, while France, Italy, and Belgium receive considerable sums on account of reparations, Great Britain receives very little after the American debt has been paid; and when the time comes for all reparations payments to be made through the International Bank under the Young Plan, this fact will be still more apparent.

British Rhine policy has certainly had a good effect on the German attitude towards England, and the British soldier has made a great contribution towards this improvement. A senior official of the Ministry of Occupied Territories in Berlin has spoken to the present writer in the highest terms of the troops, of the correctness of their whole attitude, and of the good impression they created. It was obvious, he said, from the demeanour of both officers and men that their presence in the Rhineland was through no wish on their part. The Germans much appreciated the complete detachment of the troops from internal affairs and politics, and were impressed by the high sense of justice of the General Officer Commanding. There were few instances of unpleasantness apart from the actual fact of occupation, and the people were wholly satisfied with the justice administered by the British military courts: a factor which made the greatest impression on the minds of the Rhinelanders. In conclusion, a high German official assured me that there was a general feeling of appreciation throughout Germany that it was altogether due to the firm attitude of the British delegates that the Rhineland evacuation by the end of June, 1930, was agreed upon by France at the first Hague Conference. He spoke with obvious sincerity, and even went to the length of saying that, however distasteful the occupation was, it served the one useful purpose of giving the two peoples an opportunity of understanding each other better. I had gone to the Ministry of Occupied Territories with rather mixed feelings, but I left with the conviction that, if the Germans do not actually like us, they at any rate have for us the most wholesome respect.

Against this, however, must be set the friction caused by the liquidation of German property in England which still rather rankles in German minds, although the matter has now been finally closed for better or worse in the Reparations Settlement under the Young Plan. There is also a certain amount of jealousy on the economic side, arising out of commercial competition at a time when Germany is compelled to press her export trade. But more difficult to understand has been the attitude of the German Press, which has repeatedly failed to respond to friendly acts on the part of Great Britain. While German statesmen and officials have been quick to appreciate any friendly gesture, the Press has usually alluded to the incident with reluctance, and only after official pressure has been brought to bear. The evacuation of German families from Kabul by British aeroplanes about a year ago was ignored in the German newspapers until Herr Stresemann took up the matter personally; and even then the evacuation was merely described as "by air."

Since the troops left the Rhine, perhaps the most noticeable symptom of friendliness on the part of the Germans has been the increase in callers

at the British Embassy. Hitherto it has been impossible in principle for certain German official classes to mix freely with English people in Germany, and for the same reason Germans have been unable to attend social functions in England which they always attended before the war. German officers have every year been invited to compete in the Horse Show at Olympia, but they could not well do so as long as British troops occupied German territory. Now, however, that the obstacle of principle has been removed, and the Chief of the General Staff has " broken the ice " by calling on the British Ambassador, the way is clear again for normal peace conditions, and we may again look forward to seeing German officers' chargers being led about the streets of Kensington. These may seem small things, but they mean a great deal at the important stage of renewed relations in which we find ourselves at present. Officers who have fought against each other can often do more than almost anyone else to renew friendship between their respective countries. The last few weeks have also seen an improvement in the attitude of the German country gentry, and there is a general softening on the part of those who refused to consider any form of intimacy as long as the occupation lasted. It could not be said that the war period had really come to an end until the last British soldier had left German soil.

SOVIET UNION

Concentration of Naval Forces in the Black Sea

THE Soviet Union appears to be gradually transferring its naval forces from the Baltic to augment those already in the Black Sea. At the end of last year, the battleship " Paris Commune " and the cruiser " Profintern " left the Gulf of Finland, nominally for a training cruise, but having visited Brest and Naples they passed into the Black Sea on the 17th January. It is reported that another battleship, and possibly other smaller units, are to follow.

The motives underlying these movements appear to be regarded with some apprehension by Turkey, Rumania, Bulgaria and Greece, while during the recent Naval Conference the French and Italian Delegations emphasized the effect of the Soviet naval activities on the future balance of naval power in the Eastern Mediterranean.

The passage of men-of-war through the Dardanelles and the Bosphorus is governed by a Convention regarding the régime of the Straits attached to the Treaty of Lausanne, 1923, and the Soviet movement is undoubtedly legal. The Straits Commission is answerable to the League of Nations,

which accepted responsibility for carrying out the Lausanne Convention, and the Commission have produced detailed regulations, of which the relevant one, under the general heading of " Passage of men-of-war in time of Peace," reads as follows :—" Les Puissances riveraines de la Mer Noir peuvent, en tous temps, faire passer librement tout ou partie de leurs forces navales à travers les Détroits."

As a matter of fact, neither the Soviet Union nor Yugoslavia has ever ratified the Treaty of Lausanne, so it would be open to them to repudiate the competence of the Straits Commission altogether, should they wish to do so, although the Russians have tacitly recognized it by supplying it with an annual return of their naval forces in the Black Sea.

THE STRATEGIC SITUATION OF PERSIA

BY the Anglo-Russian Agreement of 1907, Persia was divided into three spheres, northern, central and southern. Their dividing lines ran approximately from Qasr-i-Shirin through Isfahan to about Khushk in the North, and Bander Abbas through Kerman to the Perso-Afghan border South of Herat. In the northern sphere Russian influence was supreme, while in the southern sphere British influence was to be paramount. Thus the power of the British Crown westwards from India lessened as one progressed from the administered territory West of the Indus through the unadministered territory up to the borderland until it was dissipated about the Bander Abbas-Kerman line. The Russian influence southward from the Caspian suffered a similar diminution. This situation endured until the events leading up to the occupation of East and South of Persia by British forces and up to the Anglo-Persian Convention of 1920 were responsible for considerable hostility on the part of the Persians.

During the past few years there has been a remarkable change in the Persian situation. The rise of Reza Khan culminated in May, 1926, in the establishment of the Pahlevi dynasty, and in 1928 the Capitulations were abrogated. So now along our shortest line of communications between the Levant and India there lie three sovereign States—Turkey, Persia and Afghanistan: one of these, however, has virtually disintegrated.

In consequence of these events the influence of Isfahan, Shiraz and Kerman has waned, and Tehran is the seat of Government. Thus the collapse of authority in Persia could the more easily be brought about

by an advance from the Caspian than by an advance either from Iraq, the Persian Gulf ports or Baluchistan. The completion of the Trans-Persian railway, as also the improvement of the Tabriz-Tehran, Pahlevi-Tehran and ultimately the Astarabad-Tehran roads, would facilitate such an advance. From the South an advance against the capital would be an operation of considerable magnitude though it might be facilitated by the railway. As Persia possesses no navy, such an operation would be less hazardous than a normal combined operation. It is often objected that the Persian Gulf has the complexion of a British lake: if this be assumed to be true, the Persians then have only to fear a British incursion into their territory. From the East there is no danger: from the West and North West there are the possibilities of an advance from the Caucasian republics, or from a combined Russo-Turkish force from an advance *via* Iraq. The latter contingencies seem to be extremely remote.

There remains but one further possibility to be examined. Should both the States of Persia and Afghanistan disintegrate at the same time, or should the influence of an outside power at any time become paramount in both these states, then would the effect of such a political situation *inter alia* have powerful repercussions in the Middle East. Chief among these would be the need for securing British interest in Iraq and in Persia for the defence of India. Since the "grain" of the country runs from North West to South East the difficulties of transportation by road would be considerably less than those which would confront a force moving from North to South: this latter would involve the crossing of innumerable ridges. An advance from the Mediterranean might seem to offer certain possibilities. As the country rises from the plain of Iraq through the Djebal Hamrin to the great Iranian plateau, means of lateral communication are afforded by the valleys which run East and West, many of which hold villages of size, large herds and are extensively cultivated. Water in many of them is plentiful. On both the flanks of the main routes are unequalled facilities for obtaining oil fuel. A Trans-Persian railway joined to the Iraq system has immense possibilities apart from its strategic significance. A rail, road, pipe line system which would enable oil and other traffic to be shipped at a Mediterranean port from the oilfields of Persia and Iraq and from the Persian Gulf would conceivably be the greatest achievement of the first half of the XXth century. An event which would only be second in international importance would be the joining of India to Kushk by railway. In support of this, can it be urged that the march of civilization may not forever be baulked by strategical conceptions which are presumed to be disadvantageous?

THE DISPUTE BETWEEN IRAQ AND NEJD

IN view of the opportunity presented by the presence of Ibn Saud, King of the Hejaz and of Nejd, on the frontier between his country and Iraq, it was found possible to arrange a meeting between him and King Feisal of Iraq.

As a result of this meeting which took place on 22nd February last, on board H.M.S. "Lupin" anchored outside the Shatt-el-Arab, Ibn Saud undertook to attempt to settle the question of the establishment of certain Iraqui Police Posts in the Southern Desert on the Iraq-Nejd frontier within the next six months. Failing agreement he undertook to refer the matter to arbitration. It was also settled to set up a tribunal, under the presidency of a British Political Officer, at Koweit in June in order to adjudicate upon claims arising out of trans-frontier raiding.

CORRESPONDENCE

[*Correspondence is invited on subjects which have been dealt with in the* JOURNAL, *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.]

MILITARY MUSICAL RELICS

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—It may add to the interest of the article entitled "Military Musical Relics," which appeared in the JOURNAL of November, 1929, for your readers to know that there are six Russian drums in the Officers' Mess of the 1st Battalion, The Loyal Regiment (North Lancashire). One of these drums has the following inscription on it:—

> "This drum was taken by Sir J. Pennefather's Staff at the Battle of Inkerman, and left by him to Major Ellison, of Boultham Hall, Lincolnshire, who presented it to the 47th Regiment on the 1st May, 1882."

The other five drums are similar, and have been left in the keeping of the Regiment by various relatives of the officers who originally captured them, on condition that they are played on parade at least once a year.

Yours, etc.,

C. V. MOBERLY BELL.
Lieut.-Colonel, Commanding 1st Battalion, The Loyal Regiment.

Calcutta.
January, 1930.

THE CONDUCT OF MODERN WAR

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In your last issue Colonel de Watteville suggests that many difficulties in the path of the student will be smoothed away if the conduct of modern war be regarded from the tripartite aspects, Policy, Grand Strategy, and Strategy, which he defines.

That is my excuse for submitting two difficulties which I have encountered in assimilating the theories he develops.

My first difficulty lies in accepting his division of responsibility, as between Statesmen, Professional Chiefs and Commanders, deduced from the definitions given on page 74, particularly that which limits the sphere of Grand Strategy to the Chiefs of the Combatant Services (referred to subsequently as C.O.C.S.).

Although this deduction may be regarded as reasonable from the definition which precedes it, I cannot reconcile it with the later quotation from Captain Liddell Hart's "Decisive Wars of History," which is given on pages 75 and 76.

I do not wish to question this latter very clear definition of the realm of Grand Strategy, which Colonel de Watteville himself unreservedly endorses, but I do suggest that the majority of its provisions must be primarily the responsibility of

statesmen, rather than the C.O.C.S. The first provision alone, which states that " . . . the role of Grand Strategy is to co-ordinate and direct all the resources of the nation towards the political object of the war," seems to place the issue beyond all argument. I admit that in the succeeding paragraph Colonel de Watteville states that the newly-formed sub-committee of the Committee of Imperial Defence has been created to assist, on the emergency arising, the Government in translating their policy into Grand Strategy. This more moderate view, however, only tends to throw the earlier and irreconcilable generalisation into stronger relief.

It seems to me that, if Grand Strategy is to cover all the ground implied in " Policy in Execution," it should be the sphere of all departments controlling the national resources, both civil and military, as a co-ordinated and co-operating whole.

My second difficulty is connected with another quotation from Captain Liddell Hart's book, given at the top of page 75, and relating to the allotment of a force to a commander. This time I feel that the case for the soldier is understated.

The paragraph leaves me with the impression that the strength and composition of a force to be allotted to a commander is the sole responsibility of the Government. Surely, the importance of the duty laid upon the C.O.C.S. to advise as to the adequacy of the force allotted should be indicated.

Similarly, in the succeeding paragraph, if the Government formulates the policy, surely it must rely on the advice of the C.O.C.S. when it comes to " . . . adapting it to conditions which often change as a war progresses " " . . . replacing a commander " ; or " . . . modifying his objective according to the needs of its War Policy." Are not the Dardanelles Campaign and General Townshend's ill-fated advance on Baghdad classic examples of the way in which real crises may arise from failure to appreciate the military issues involved in just such questions ?

To summarize, the more expert authority is consulted the more it appears that at no stage in the conduct of modern war can definite limits be set as to the division of responsibility between the Statesmen and the C.O.C.S.

It follows that close co-operation and constant co-ordination between the Service and civilian spheres must be the keynote in war, and the study and appreciation of each other's activities and problems of the first importance in peace.

Any suggestions, therefore, for the study of this important and difficult aspect of our profession should be based only on the clearest and least controversial principles.

Yours, etc.,

Halton Camp, Bucks.
March, 1930.

J. W. BAKER,
Flight-Lieutenant, R.A.F.

[Flight-Lieutenant Baker's comments are much to the point. We would point out to him, however, that in the article under discussion it was remarked :— " To draw a clear-cut dividing line between War Policy and Strategy, that is Grand Strategy as defined above, may not always be easy. Still, it is obvious that there must be a sphere in which the Statesman . . . must be supreme, just as there must be another sphere in which the Statesman must allow the strategist to have, relatively speaking, a free hand." Otherwise we run the risk of " making war by committees."

Naturally, the professional heads of the Services must be consulted by the statesman in matters appertaining to war, just as one or more civilian ministers must attend the meetings of the C.O.S.'s Committee. In fact, there may have to

be a permanent civilian minister appointed to such a function. In any case, it must be remembered that, if the Chief of Staff's Committee is as yet in an early stage of development, the germ of the future organism is there.

Grand Strategy cannot be the sphere "of all departments controlling the national resources," as our correspondent suggests. Such a proceeding would, again, be little better than making war by committee.

As for his second "difficulty" is it not generally accepted that the professional Chiefs must make known their views, and *not* wait as they did in 1914-15? When they have done so, it is for the Statesman to decide.—EDITOR.]

CO-ORDINATION OF IMPERIAL DEFENCE

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In case you may not have noticed the criticism of Major Elliot's lecture on "Co-ordination of Imperial Defence," which appeared in "The Canadian Defence Quarterly" for April, 1930, I am sending you the enclosed extract:—

"Co-ordination of Imperial Defence is a subject which merits deepest examination, but Major Elliot defeats his purpose by placing outside the scope of his lecture the co-operation between the ordinary citizens of the Empire. As a matter of fact, co-ordination of Imperial Defence depends on the existence of such co-operation. The relations between the Governments of the Empire are an approximate reflection of the views of the people electing them. Without close relations between the various peoples of the Empire there can be no effective co-ordination as regards Imperial Defence.

Major Elliot is incorrect when he states (R.U.S.I. JOURNAL, February, 1930, page 6), that no provisions exist for military collaboration between Great Britain and the other Imperial self-governing units—they do. But it profits little to discuss improved machinery for the co-ordination of Imperial Defence until a demand for more efficient machinery has been created. That demand must come from the layman; it is he who governs the policy, which, in turn, controls the measures for defence.

The ties that bind the Imperial group together are sentimental, intellectual and material, and when it comes to peace-time decisions on expensive matters like defence, the strength of the material tie is inclined to be the important factor. The problem is how to convince the layman that close co-operation is required. As far as the material factor is concerned, perhaps the forthcoming Imperial Economic Conference will supply the answer."

I am, Sir,

London. Yours, etc.,

April, 1930. A CANADIAN MEMBER.

THE BRITON AS A FIGHTING MAN

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In the February JOURNAL Colonel Field, R.M., quotes the line: "Saxon and Norman and Dane are we," which he attributes to Kipling.

The quotation is from "A Welcome to Alexandra," and Kipling must have written it, I fancy, about the time Tennyson was finishing "Barrack-room Ballads!"

Yours, etc.,

Guildford. ASTLEY TERRY,

7th April, 1930. Colonel (r.p.).

THE ART OF GENERALSHIP

To the Editor of the R.U.S.I. Journal.

Sir,—I should like to thank you for your review of my work, "The Art of Generalship," which was as favourable as I could expect, although your Reviewer enjoyed exercising his power of sarcasm over my claim for Anglo-Irish superiority in the production of great generals. Still, he has to go back a long way to find others in the same class as those I named. I can readily concede him various earlier leaders as great English generals, besides those he mentions, Marlborough and Cromwell, but I thought a time limit was reasonable, and I was treating only of our modern military epoch, which, in my view, commenced in Napoleon's day, and may possibly have been ended by the Great War. In that period the military lessons have been consecutive and continuous, and it is hard to deny that on our side the Anglo-Irishmen, Wellington, Wolseley, Roberts and Wilson, have been pre-eminent exponents of the art of war.

Nevertheless, I am surprised that your Reviewer considers my belief in the "Western school of Strategy" to have only been imbibed through the medium of catch-phrases, and to be unsupported by argument. I detest catch-phrases, believing them to be as mischievous and sterile in military action as the formula or slogan is in political life. I cannot conceive that my conclusions could possibly be attributed to their influence. But I certainly understood that the Western school of strategy was generally accepted by studious military opinion, and that any argument on it would only be a forcing of an open door on the one side, and a flogging of a dead horse on the other. I did not argue the matter, but I did try to give some historical illustration of the wisdom of the Western advocates and the folly of those who favoured the Eastern theory. I pointed out that Napoleon had a problem of East or West somewhat analogous to our late situation, and that by his selection of the Eastern front he achieved his own ruin. I also tried to show that in our problem of his period we expended our strength looking for "ways round," when the direct way was the right one. Seven years heroic struggle in Spain gained us less result than the seven weeks culminating in Waterloo. My chapter on Salamanca was specially devised to inculcate that lesson.

Neither do I see why the French should not be taken as a "model for imitation" where their performances were better than ours, as from my own observation I am led to believe they were on the Somme. I accept the correction that their "weight of metal" there was heavier than ours; but had we not available resources to add to ours, or was the Napoleonic maxim—the concentration of strength at the decisive point (perhaps only a catch-phrase!)—overlooked? The French had the re-capture of the lost ground at Verdun also on hand; we had no other serious venture then current. Our characteristic reluctance to admit our shortcomings, and profit by example in some phase or feature of the military art, is, I think, responsible for much of the costly failure which often attends our efforts before we finally attain success.

Yours, etc.,

C. O. Head,

Lieut.-Colonel.

29*th March*, 1930.

GENERAL SERVICE NOTES

NETHERLANDS

MINISTRY OF DEFENCE.—The amalgamation of the Ministries of War and Marine, which was authorized in 1928, does not appear to be working quite smoothly yet. All civil personnel employed by the fighting Services, with the exception of dockyard workmen, have been brought under single control. The Minister of Defence, in a Memorandum dated 9th December, 1929, stated, however, that the amalgamation of the General and Naval Staffs, and that of the respective departments dealing with material, presents so many difficulties that several years must elapse before it can be attempted.

GERMANY

GRAND ADMIRAL VON TIRPITZ

By the death of Alfred von Tirpitz, on 6th March, Germany has lost one whom many will rank as the greatest German since Bismarck. From the point of view of patriotic achievement alone he must be placed among the strong men of modern times.

Born at Küstrin in 1849, he was of the old Prussian landowning stock, and his ancestors had been servants of the State for many centuries. In spite of the low social status and few professional attractions possessed by the Navy at that time, Tirpitz prevailed over family opposition and entered that Service in 1865. He lived through the initial five years of his career under war conditions, and the inability of the German fleet to influence the course of the Franco-Prussian war made a deep impression on him.

In 1892, Tirpitz was appointed to the Naval Staff in Berlin, and during his appointment proposed the centralisation of the various departments of the High Command under the Naval Secretary. This proposal was not approved, and the divisions remained.

In 1895, he was promoted to Rear-Admiral, and appointed to command the Asiatic Cruiser Squadron. On his advice, Tsingtao was selected as the best site for a naval base. On his return home, he was made Secretary of State for the Navy, and occupied that post for eighteen years. He presented his Navy Bill to the Reichstag in 1898, and persuaded the Deputies to pass it. The Bill made provision for 17 battleships and a cruiser force of 9 large and 26 smaller cruisers. The programme was to be completed in seven years, at an annual expenditure on new construction of about 7,000,000 marks.

This building programme was sanctioned by the sections of the population which were most concerned in the growth of German industry and trade. The British battlefleet was then far stronger than the projected German fleet, and the French fleet was still sufficiently strong to meet the expanded German Navy.

Two years later, however, Tirpitz brought in and passed a second Navy Bill, which definitely opened a race in naval armaments. By this Bill the German Navy was to be doubled by the year 1916.

In 1906, however, the " Dreadnought " was launched. Tirpitz was puzzled by the appearance of this ship, and was disinclined to believe that the fleet he had been creating for the last eight years was practically obsolete. But in 1908 the Germans launched their first Dreadnought, the " Nassau."

Tirpitz's policy was now to ask for a yearly allowance of battleships and cruisers, and to cover his request with a cloud of technicalities.

In August, 1914, Tirpitz was still Naval Secretary, but from the outbreak of hostilities the independent jurisdictions of the Chief of the Naval Staff and the Chief of the Naval Cabinet were irksome to one who had built up the German fleet. He had never accustomed himself to co-operate with equals.

His efforts to employ the High Sea Fleet and his demands for the unremitting employment of the submarine in 1915 and 1916 were in vain, and, disgusted with the timid use of the resources which he had built up, he twice, during 1915, offered to resign. Then, at the time of the " Arabic " crisis, he was told to mind his own business, and he resigned, never to enter the public service again. The Kaiser parted with his great Minister with apparent indifference.

Tirpitz embodied the Prussian spirit of ruthless national ambition, and his life work, concentrated in his eighteen years as Naval Secretary, was the raising of the German Navy from a position of insignificance to one of such formidable power as to challenge the supremacy and threaten the existence of Great Britain. Had he been given in 1914, as he expected, the handling of the fleet he had created, its destruction would not have been self-inflicted at Scapa Flow.

UNITED STATES

Combined Exercises.—Combined manœuvres on an extensive scale were due to take place in Panama in February and March, with the object of testing the existing defence schemes of the Canal. Special attention was to be paid to the development and importance of communications, and of the co-operation between the harbour defence forces and naval patrols. The conditions were to be made to approximate to those of war.

(*See also* " Air Defence Notes," page 447).

NAVY NOTES

GREAT BRITAIN.

New First Sea Lord.

The Admiralty announced on 3rd March that His Majesty the King has approved of the appointment of Admiral Sir Frederick L. Field, K.C.B., K.C.M.G., to be a Lord Commissioner of the Admiralty and Chief of the Naval Staff, in succession to Admiral of the Fleet Sir Charles E. Madden, Bt., G.C.B., G.C.V.O., K.C.M.G., D.C.L., LL.D., to date about 1st July, 1930.

Sir Frederick Field has been Commander-in-Chief in the Mediterranean since 8th June, 1928. His previous Admiralty experience has been as Director of Torpedoes and Mining, 1918–20; Third Sea Lord and Controller, 1920–23; and Deputy-Chief of the Naval Staff, 1925–27, in which capacity he was the principal British Naval Delegate at the Geneva Naval Conference.

First and Principal Naval Aide-de-Camp.

Admiral Sir Edwyn S. Alexander-Sinclair, K.C.B., M.V.O., is to be First and Principal Naval Aide-de-Camp to H.M. the King, in succession to Admiral Sir William E. Goodenough, G.C.B., M.V.O., to date 23rd May. Sir Edwyn was due to haul down his flag as Commander-in-Chief at the Nore on 16th May. With the retirement of Sir William Goodenough, and the promotion to Admiral of the Fleet of Sir Roger Keyes, he will be at the head of the active list of his rank.

New Admiral of the Fleet.

The Admiralty announced on 24th March that Admiral Sir Roger J. B. Keyes, Bt., K.C.B., K.C.V.O., C.M.G., D.S.O., LL.D., D.C.L. (Oxon.), is to be Admiral of the Fleet, with effect from 8th May, in succession to Admiral of the Fleet the Hon. Sir Somerset Gough-Calthorpe, G.C.B., G.C.M.G., C.V.O., who retires on that date. Sir Roger Keyes has been Commander-in-Chief at Portsmouth since 29th April, 1929.

Flag Appointments.

Commander-in-Chief, Atlantic.—Admiral Sir Michael H. Hodges, K.C.B., C.M.G., M.V.O., Second Sea Lord, is to be Commander-in-Chief, Atlantic Fleet, in succession to Vice-Admiral Sir A. E. M. Chatfield, K.C.B., K.C.M.G., C.V.O., to date about 27th May.

Commander-in-Chief, Mediterranean.—Vice-Admiral Sir Ernle Chatfield, from the Atlantic Fleet, is to be Commander-in-Chief, Mediterranean, in succession to Admiral Sir Frederick L. Field, K.C.B., K.C.M.G., to date about 27th May.

Second Sea Lord.—Vice-Admiral Sir Cyril T. M. Fuller, K.C.B., C.M.G., D.S.O., is to be a Lord Commissioner of the Admiralty and Chief of Naval Personnel, in succession to Admiral Sir Michael H. Hodges, to date about 27th May.

COMMANDER-IN-CHIEF, AMERICA AND WEST INDIES.—Vice-Admiral Vernon H. S. Haggard, C.B., C.M.G., Fourth Sea Lord, is to be Commander-in-Chief, America and West Indies Station, in succession to Vice-Admiral Sir Cyril T. M. Fuller, to date 21st April.

DEPUTY-CHIEF OF THE NAVAL STAFF.—Vice-Admiral Frederick C. Dreyer, C.B., C.B.E., late in command of the Battle Cruiser Squadron, is to be a Lord Commissioner of the Admiralty and Deputy-Chief of the Naval Staff, in succession to Vice-Admiral Sir William W. Fisher, K.C.B., C.V.O., to date 30th June.

FOURTH SEA LORD.—Rear-Admiral Lionel G. Preston, C.B., late in command of the Third Cruiser Squadron, Mediterranean, is to be a Lord Commissioner of the Admiralty and Chief of Supplies and Transport, in succession to Vice-Admiral Vernon H. S. Haggard, to date 21st April.

REAR-ADMIRAL, SECOND BATTLE SQUADRON.—The appointment of Rear-Admiral C. J. C. Little, C.B., as Rear-Admiral, Second Battle Squadron, announced in the last issue of the JOURNAL, has been ante-dated from 6th May to 26th April, 1930.

THIRD BATTLE SQUADRON.—The appointment of Rear-Admiral George F. Hyde, C.V.O., C.B.E., Royal Australian Navy, to succeed Rear-Admiral H. K. Kitson in command of the Third Battle Squadron, is to date 6th May, not 6th March, as stated in the last issue of the JOURNAL. In his Notes accompanying the Navy Estimates, the First Lord states that, for reasons of economy, the two ships of the "Iron Duke" class which, under the title of the Third Battle Squadron, have formed part of the Atlantic Fleet and provided seagoing training for boys, have now been stationed at Portland for training purposes, where they form an independent command.

FLAG LIST CHANGES.

A run of promotion to Flag rank was started on 1st April by the retirement, at his own request, of Admiral Sir Hugh D. R. Watson, K.C.B., C.V.O., C.B.E., late Vice-Admiral Commanding the Reserve Fleet. In consequence, Vice-Admiral Sir A. Ernle Chatfield, K.C.B., K.C.M.G., C.V.O., was promoted to Admiral; Rear-Admiral Henry E. Grace, C.B., to Vice-Admiral; and Captain W. F. Sells, C.M.G., A.D.C., to Rear-Admiral.

Vice-Admiral Grace was placed on the retired list on promotion, to date 2nd April, whereby Rear-Admiral Lionel G. Preston, C.B., was promoted to Vice-Admiral, and Captain Cyril St. C. Cameron, C.B.E., A.D.C., to Rear-Admiral.

Rear-Admiral Sells was placed on the retired list, to date 2nd April, whereby Captain Patrick E. Parker, D.S.O., A.D.C., was promoted to Rear-Admiral.

Rear-Admiral Cameron was placed on the retired list, to date 3rd April, whereby Captain Robert C. Hamilton, A.D.C., was promoted to Rear-Admiral.

Rear-Admiral Parker was placed on the retired list, to date 3rd April, whereby Captain Geoffrey Mackworth, C.M.G., D.S.O., A.D.C., was promoted to Rear-Admiral.

Rear-Admiral Hamilton was placed on the retired list, to date 4th April, whereby Captain Aubrey Lambert, A.D.C., was promoted to Rear-Admiral.

Rear-Admiral Mackworth was placed on the retired list, to date 4th April, whereby Captain C. W. Round-Turner, C.M.G., A.D.C., was promoted to Rear-Admiral.

Rear-Admiral Lambert was placed on the retired list, to date 5th April, whereby Captain Richard A. S. Hill, C.B.E., A.D.C. (Commodore, Second Class), was promoted to Rear-Admiral.

The Navy Estimates.

The Navy Estimates for 1930–31 were issued on 6th March (No. 84, price 10s.), accompanied by the Statement of the First Lord of the Admiralty (Cmd. 3506, price 3d.). They showed a reduction of £4,126,000 below the Estimates for 1929–30, the net total being £51,739,000 as against £55,865,000.

The First Lord in his Statement said that this substantial decrease is mainly due to the reductions which the Government have felt justified in making in the shipbuilding programmes of 1928 and 1929. If the full programmes of these two years had been put into effect, the new construction provision must have risen by over £1,000,000 to the neighbourhood of £10,000,000, as compared with the provision of £8,621,626 in 1929. Actually, the provision now proposed is £5,603,481. The effect of the changes is, therefore, to reduce expenditure on new construction in these Estimates by over £4,000,000.

As to future shipbuilding, the Government have decided not to formulate any proposals, said the First Lord, until the results of the Naval Conference are known and have been fully considered. No provision, therefore, is included in these Estimates for commencing any further new construction in 1930. As soon as the Government are in a position to inform Parliament of their intentions, a statement will be made on the subject and, if necessary, a supplementary estimate will be presented.

Next to the reduction in new construction, the most noteworthy feature in the Estimates is the reduction which they forecast in naval personnel. The First Lord states that great attention has been paid by the Admiralty in recent years to the question of Fleet numbers, with the object of securing the greatest possible economy in personnel, without, of course, jeopardising essential requirements, including proper provision for training. Vote A for 1929 provided for 99,800 officers and men, but it was explained that this, the maximum number to be borne during the year, was the anticipated bearing on 1st April, 1929, and would fall to 98,800 by 1st April, 1930. As a result of further economies, the number now proposed to be reached by 1st April, 1930, is 97,050, which is expected to fall to 94,000 by the 1st April, 1931.

The First Lord referred to a variety of topics in his "Notes on Matters of General Interest." In order to relieve the berthing congestion at Malta, four ships of the "Queen Elizabeth" class have been transferred to home waters. For reasons of economy, the Third Battle Squadron, which has formed part of the Atlantic Fleet and provided seagoing training for boys, has been stationed at Portland for training purposes, as an independent command. The six "Parthian" class submarines when ready will follow the six "Odin" class to China. The new sloops of the "Folkestone" class will relieve four older sloops abroad—three in the Persian Gulf and one on the America and West Indies Station. Four more old sloops will be disposed of as a result of these changes.

Under the heading of "Fishery Protection," the First Lord announces the decision of His Majesty's Government to build and equip a special vessel on the lines of the "Discovery II," with the object of extending the field of survey for new fishing grounds. The Admiralty will be responsible for the design and building of the vessel, which will be manned with naval personnel and will fly the white ensign. (*See under* "Material.").

Although no new expenses are being incurred at Singapore, the progress of work on the main engineering contract renders it necessary to provide £220,000 more in these Estimates than was voted for the base in 1929. The floating dock is now in use, the "Cumberland" being docked on 16th September.

PERSONNEL.

MEDICAL DIRECTOR-GENERAL.—Surgeon Vice-Admiral Arthur Gaskell, C.B., O.B.E., has been granted an extension of his appointment as Medical Director-General of the Navy, of one year from 1st June, 1930, when he will complete the ordinary term of three years. Similar extensions were granted to his immediate predecessors.

THE ENTRY OF OFFICERS.—Speaking in the House of Commons on 17th March, during the Navy Estimates debate, the First Lord, Mr. Alexander, said with reference to the question of entry into the officer rank, that he believed inquiries would show that there was room for extending the special entry system, and for that system to include a larger number of candidates from the secondary schools; adding, "we should democratize the officer ranks in the Navy in such a way that a man would not be made to feel awkward and out of place when he was suddenly introduced into the officers' mess."

CLOSE EXHIBITIONS FOR OFFICERS' SONS.—Fleet Orders notify that Close Exhibitions for the sons of officers of the R.N. and R.M., serving and retired, are awarded by the Governors of St. Edward's School, Oxford, thrice yearly. Application for details of the exhibitions should be made to the Warden of the School.

UNIFORM ERROR.—The illustration of the shoulder-strap of a Paymaster Rear-Admiral in Plate 10 of the "Uniform Regulations for Officers of the Fleet" is incorrect, the piping of white distinction cloth being omitted. The plate will be corrected in the next amendment.

GOODENOUGH MEMORIAL PRIZE.—The Goodenough Memorial Prize for the year 1929 has been awarded to Sub-Lieutenant H. G. T. Padfield, R.N., of the cruiser "Enterprise."

RYDER MEMORIAL PRIZE.—A Ryder Memorial Prize has been awarded to Acting Sub-Lieutenant R. I. A. Sarell, R.N., of H.M.S. "Excellent," who passed the best examination in French in the Sub-Lieutenants' educational courses held at the R.N. College, Greenwich, during 1929. There was no award of a Ryder Prize on the result of the annual examination in foreign languages held in December, 1929, as no executive officers were candidates in French. In future, the Ryder Prize will be awarded only on the results of the Acting Sub-Lieutenants' Educational Course at the R.N. College, Greenwich.

PRIZES FOR NAVAL HISTORY.—The following were awarded prizes as shown on the result of the annual examination in Naval History for 1929:—Lieutenant M. F. B. Ward, "Greenwich" (previously awarded a certificate of merit), prize of £20; Lieutenant H. P. Currey, "Carlisle," prize of £10 and certificate of merit; and Lieutenant G. B. H. Fawkes, "Dolphin," prize of £10 and certificate of merit.

REDUCED PENSION RATES.—In consequence of the fall in the cost of living since the present scale of pensions for naval ratings and marine "other ranks" was fixed in 1919, a modification of the rules for computing long service and disability pensions has been made for all men and boys finally entered or re-entered after 31st March, 1930. As regards long-service pensions, the basic rate for each

year of service of 1½d. a day is reduced to 8d. a week. The lowest scale of disability pensions is reduced from 1s. 6d. a day to 8s. a week, and other scales in proportion.

1930 WELFARE CONFERENCES.—Welfare Conferences, on substantially the same lines as in 1928, are being held in 1930, the interport meetings taking place at Portsmouth. The election of lower deck representatives is confined to the ships and establishments at Portsmouth, Plymouth and the Nore.

NAVY WEEKS, 1929.—Admiralty Fleet Order No. 454 of 14th February, 1930, gives details of the distribution of the sums secured for Naval Charities last year.

The statement of accounts shows that the proceeds at the three ports were as follows :—

	£	s.	d.
Portsmouth (admission 92,468)	5,263	6	11
Chatham (admission 55,412)	3,107	18	5
Plymouth (admission 87,393)	5,263	0	11

The " Navy Weeks " of 1930 will be held between 2nd and 9th August.

MATERIAL.

STATE OF PROGRAMMES.—As announced under " Navy Estimates," no programme of new construction is yet proposed for 1930. The revised 1929 programme consists of the following :—

One 6-in. gun cruiser, to be laid down at Devonport.

One leader and four destroyers, of which two destroyers will be built at Portsmouth and the rest by contract.

Four sloops, of which two—" Shoreham " and " Fowey "—have been laid down at Chatham and Devonport respectively, and the other two are also to be built at those dockyards.

One tender to H.M.S. " Vernon," to be built at Portsmouth.

NAMES OF NEW SHIPS.—The Admiralty announced on 3rd April that the cruiser to be built at Devonport Dockyard will be called the " Leander," a well-known frigate and cruiser name, dating back to 1780. The flotilla leader to be built by contract will be called the " Kempenfelt," the name of which Admiral was adopted for a flotilla leader during the late war. The destroyers will be the " Crusader " and " Comet," to be built at Portsmouth Dockyard ; and the " Cygnet " and " Crescent," to be built by contract. They will be known as the " Crusader " class. The two unnamed sloops of the programme, besides the " Shoreham " and the " Fowey," will be called the " Bideford " and the " Rochester."

THE 1928 PROGRAMME.—The revised 1928 programme consists of the following:—

Flotilla-leader " Keith," laid down October, 1929, by Vickers-Armstrongs.

Eight destroyers, " Beagle " class, laid down by contract, July to October, 1929.

Four submarines, " R " class (reduced from six), laid down June and July, 1929, " Rainbow " at Chatham and three others by contract.

Four sloops, " Hastings " class, completing, two at Devonport and two by contract.

One gunboat, " Falcon," ordered from Yarrow & Co., December, 1929.

SLOOPS LAUNCHED.—The first of the foregoing vessels of the 1928 programme to be put afloat are the four sloops. At the yard of Swan, Hunter and Wigham

Richardson, Ltd., Wallsend-on-Tyne, on 12th February, the "Folkestone" was launched; and on 14th March the "Scarborough" was put afloat at the same yard. The "Hastings" and "Penzance" were floated out at Devonport Dockyard on 10th April.

These sloops are of 1,040 tons, and with geared turbines of 2,000 horse-power will have a speed of about 16½ knots. The armament includes two 4-in. guns, one being of anti-aircraft pattern. (Compare with U.S.A. Coastguard Cutters.[1])

THE 1927 PROGRAMME.—The cruiser "Exeter," building at Devonport under the 1927 programme, will not be completed until 1931. The flotilla-leader "Codrington" is due to be completed on 22nd May, and will relieve the "Keppel" as leader of the Third Flotilla, Mediterranean Fleet. The eight destroyers of the "Acasta" class in this programme are joining the same Flotilla. The "Acasta" was commissioned with a full crew at Devonport on 14th February, and left Portsmouth for the Mediterranean on 18th March. The "Active" was commissioned at Portsmouth on 11th February, pending completion to full complement in March. The "Anthony" was commissioned with a full Chatham crew at Chatham on 11th March; and the "Arrow" was commissioned at Barrow on 24th March with a Chatham navigating party for passage to Chatham. The "Achates" was commissioned two days later with a Devonport party, and arrived at Devonport on the 29th. The "Antelope" was completed on 15th March, and arrived at Portsmouth on the 21st. The "Ardent" was completed on 14th April, leaving only the "Acheron" to be finished.

LAUNCH OF THE "ACHERON."—The "Acheron," the first destroyer to be fitted with special machinery designed to make use of high pressure steam, was launched at the works of Messrs. Thornycroft & Co., Ltd., Southampton, on 18th March. Her geared turbines are being manufactured by the Parsons Marine Steam Turbine Company, steam being supplied by three water-tube boilers, designed and manufactured by Messrs. Thornycroft. Sir Charles Parsons estimates that the "Acheron" should be 10 or 15 per cent. more economical than her sister vessels with half her boiler pressure. He hopes that in time we shall get high pressure in all warships and in the Mercantile Marine. That would lead to an increase in efficiency, which would bring consumption down to ½-lb. of fuel per horse-power, or almost the same as the Diesel engine.

1927 SUBMARINES.—Of the six submarines in the 1927 programme, four were orders from Vickers-Armstrongs, Ltd., Barrow. The first two were completed, the "Perseus" on 15th April and the "Poseidon" on 30th April. The "Proteus" and "Pandora" were due to follow them in May and June. The "Phœnix," building by Cammell, Laird & Co., Birkenhead, should be completed in August, 1930, and the remaining vessel is the "Parthian," at Chatham Dockyard.

NEW FISHERY VESSEL.—In reply to a question on 12th March, the First Lord of the Admiralty stated that the approximate tonnage of the fishery survey vessel was 1,400. She will be flush-decked, built on similar lines to the surveying vessel "Endeavour," and equipped for survey work in cold climates. Her length will be 220 ft.; beam, 35 ft.; mean draught, 12½ ft.; machinery, triple expansion reciprocating engines of 1,200 i.h.p.; single screw; speed, 12 knots; and total oil fuel capacity, 340 tons.

ADMINISTRATION AND ORGANIZATION.

MOBILIZATION DEPARTMENT TITLE.—A Fleet Order on 28th February notified that the title of the Mobilization Department, Admiralty, will in future be Manning

[1] See R.U.S.I. Journal, November, 1929, p. 869

Department. The Head of the Department will have a new title, " Director of Manning," the short title, " D.M.D.," remaining unchanged.

PEMBROKE DOCKYARD TRANSFERRED.—H.M. Dockyard, Pembroke Dock, was transferred to the Air Ministry on 31st March, and the Naval Officer in Charge is to be withdrawn. When there is no Resident Naval Authority at Pembroke, the duty of reporting arrivals and departures of H.M. ships will devolve on senior or commanding officers. A deputy naval store officer remains in the dockyard for charge of the oil fuel depot. Communications regarding supply and fuelling arrangements at Pembroke Dock may be addressed to this officer.

RETURN OF WEI-HAI-WEI.—An agreement for the rendition of Wei-Hai-Wei to China was signed on 18th April in Nanking by Sir Miles Lampson, British Minister, and Mr. C. T. Wang, Minister for Foreign Affairs.

Since the great Powers ceased to maintain large fleets in the Far East, Wei-Hai-Wei has been used as a health station for the vessels of the China Squadron. Its return to China had long been agreed on in principle. The new treaty provides that Wei-Hai-Wei and its properties are returned without compensation, but that the island of Liuking may be used by British naval units as a summer resort for ten years. Should China desire to use Wei-Hai-Wei for a naval base, this privilege may be suspended at any time.

KIRKENES AND FISHERY PATROLS.—As a result of communications between the British and Norwegian Governments, it has been agreed that British fishery protection vessels may use Kirkenes for taking in water and provisions, and for giving their crews some opportunities for recreation. Kirkenes is at the head of the Bok Fiord, on the North-East coast of Norway, close to the Finnish border.

EXERCISES AND CRUISES.

COMBINED FLEET EXERCISES.—The Mediterranean Fleet, under Admiral Sir Frederick Field, left Malta on 8th March, and on the 10th and 11th engaged in a strategical exercise to the eastward of the Balearic Islands with the Atlantic Fleet, under Vice-Admiral Sir Ernle Chatfield. The combined Fleets afterwards anchored at Palma. On 15th March, they left to carry out tactical exercises, and arrived at Gibraltar on the 18th. The Atlantic Fleet left for home on 25th March, and the Mediterranean Fleet for its Spring cruise on 1st April, and between that date and 25th April individual ships or flotillas visited Villefranche, Toulon, Golfe de Juan Rapallo, Barcelona, Marseilles, Cannes, Tarragona, Algiers, and various other foreign ports and towns.

SOUTH AMERICAN CRUISES.—Vice-Admiral Sir Cyril Fuller, in the " Despatch," cruised off the coasts of Chile and Peru during February and March. At Antofagasta he left the flagship to proceed to La Paz, the capital of Bolivia, and rejoined the ship at Mollendo. Callao and Guayaquil were also visited before the "Despatch" returned through the Canal at the end of March. The "Durban" visited Havana, New Orleans, Houston, Galveston, Vera Cruz, and other foreign ports. The " Delhi " visited Montevideo in the first week of March, and after going down to Port Stanley, cruised back up the South-East coast, visiting a number of ports, including Buenos Aires. She was ordered to make a cruise up the Amazon at the end of August, 1930. The " Dauntless," on leaving Portsmouth for the America Station on 8th April, was ordered to make her first cruise to Esquimalt and the vicinity. The " Dragon " left Sheerness on 27th March for Gibraltar and Rio de Janeiro, and was to meet the " Delhi " at Montevideo and afterwards to cruise through the Magellan Straits and up the West coast.

Miscellaneous.

Dockyard Holidays.—In accordance with the decision of the Government to grant one week's annual leave with pay to all workpeople in the Royal Dockyards and other Admiralty establishments, the Dockyards are to be closed, as regards the general work of the employing departments, for the week commencing Monday, 4th August, 1930 (Bank Holiday). Easter Monday was granted as a Dockyard holiday in place of the August Bank Holiday included in the "closed" week.

Merchant Ship Signalling.—The reports rendered by ships of signalling practices with British merchant vessels for the quarter ended 30th September, 1929, showed a total of 1,322 successful exercises carried out, as compared with 1,822 for the previous quarter; and there were five failures to establish communication.

Depth Charge Accident in a Destroyer.

As a result of an accident with a depth charge during exercises off Hong Kong, a Warrant Officer and five ratings of H.M.S. "Sepoy," Lieutenant-Commander H. E. Reid, R.C.N., lost their lives. The accident occurred on the morning of 8th April, when the "Sepoy" was exercising with other ships.

Apparently the dry guncotton primer of a depth charge exploded while being handled prior to insertion in the charge. Mr. L. G. Reed, R.N., Gunner (T), of Portsmouth, and three ratings (Walter Belderson, P.O., Gillingham; Thomas E. Smith, A.B., Dover; and James N. R. Cooper, A.B., Plaistow), were killed outright, the bodies of two of them being blown overboard, whence they were recovered later. Two other ratings, William J. A. Draper, A.B., Kew, and Robert W. Heywood, A.B., Greenwich, died of their injuries. Petty Officer Reginald J. Pitt, of Gillingham, was slightly injured.

The First Lord of the Admiralty received the following message from the King:—

> "The King is distressed to hear of the disastrous accidental explosion on board H.M.S. 'Sepoy,' resulting in the loss of valuable lives. His Majesty desires that his heartfelt sympathy may be conveyed to the bereaved families, and inquiries made on his behalf as to the condition of the injured."

THE FLEET AIR ARM.

Henry Leigh Carslake Prize.—The Henry Leigh Carslake Prize, awarded annually to the Naval Observer submitting the best essay on the work and development of the Fleet Air Arm, has been awarded for 1930 to Lieutenant A. D. Torlesse, R.N., of H.M. Aircraft-Carrier "Courageous."

The subject of the essay for 1931 is:—"The employment of aircraft in the protection of a convoy from attacks by hostile submarines and aircraft." Essays must reach the Admiralty by 1st February, 1931.

Aircraft-Carrier Changes.—On trial off Rothesay in the week ending 22nd March, the "Glorious," Captain D. F. Moir, D.S.O., was reported to have reached a speed of 35 knots, which was understood to be a world's record for a warship of this size. The "Glorious" is attached to the Atlantic Fleet from 29th March until she leaves for the Mediterranean about the end of June, to replace the "Courageous." The "Courageous" returned to Devonport on

5th February, and was taken in hand for a re-tubing refit, which should be complete about the end of July.

ROYAL NAVAL VOLUNTEER RESERVE.

RETIREMENT.—Captain R. C. Primrose, V.D., R.N.V.R., the Commanding Officer of the Clyde Division, was placed on the retired list at his own request on the 14th February last.

APPOINTMENTS.—Captain J. M. Robertson, V.D., R.N.V.R., appointed in command of the Clyde Division to date 14th February, 1930, *vice* Captain R. C. Primrose, V.D., R.N.V.R., retired.

Commander W. F. Keay, V.D., R.N.V.R., appointed in command of the East Scottish Division R.N.V.R., to date 14th February, 1930, *vice* Captain J. M. Robertson, V.D., R.N.V.R., transferred to Clyde Division.

MERSEY DIVISION.—On 9th February, 1930, the R.N.V.R. War Memorial was unveiled in H.M.S. "Eaglet" by Mr. J. Masefield, and dedicated by the Chaplain of the Fleet. Prior to the service, a march past took place, the Lord Mayor of Liverpool taking the salute.

SPRING CRUISE OF ATLANTIC FLEET.—Five officers and a large number of ratings R.N.V.R. embarked with the Atlantic Fleet for the Spring cruise this year.

ROYAL MARINES.

NEW NON-SUBSTANTIVE RATING.—A new gunnery non-substantive rating, known as "Q.G." (qualified in gunnery), and corresponding to the rating of seaman gunner, with pay at the rate of 3d. a day, has been introduced as from 20th January, 1930, for Royal Marines below the rank of corporal. Qualifying and requalifying courses for Q.G. are identical with those laid down for Q.M., but nine months' sea experience is required before undergoing the course. The designation Q.M. is no longer to be used.

ANNUAL RIFLE MEETINGS.—For the non-central meetings of the Royal Marines Rifle Association, 1930, the Corps was divided into seven units, made up of the Divisions at Chatham, Portsmouth, Plymouth, and the R.M. Depot, Deal; and Royal Marines afloat from Chatham, Portsmouth and Plymouth. Afloat units are not now recognized as such by the N.R.A., but members of these may shoot for their divisional teams in N.R.A. competitions. Each unit was ordered to select a period not exceeding seven working days between 31st March and 14th June, for their non-central meeting to be held. The Central Meeting will be held at Bisley between 30th June and 5th July.

ROYAL MARINE BANDS.—The question is under consideration for the removal of the Royal Naval School of Music from Eastney to the Royal Marine Depot at Deal. In his annual report, Major Percival Owen, Superintendent of the School, states that the strength of the band boys there was 277, and 74 boys are at present embarked.

In a few respects it had been found that the School bands were a little out of date. They had to meet a certain amount of competition from outside. More saxophones had been introduced, in addition to a trained pianist and a trained drummer: important additions for dance bands.

DOMINION NAVIES.

ROYAL AUSTRALIAN NAVY.

INTERCHANGE OF CRUISERS.—The next interchange of cruisers between the Royal Navy and Royal Australian Navy will take effect about October, 1930, when the " Canberra " will join the First Cruiser Squadron, Mediterranean Station, and a ship of the " London " class in that Squadron, to be decided later, will proceed to Australia. The last exchange of the kind was between the " Delhi " and the " Melbourne " in 1926.

NAVAL ECONOMIES.—The Hon. A. E. Green, M.P., Commonwealth Minister of Defence, expects to save £663,000 in the coming financial year by the abolition of military camps and other naval and military economies. He denies all reports of other cuts in the Defence Estimates, except that of the decision to co-ordinate the Royal Naval College at Jervis Bay and the Royal Military College at Duntroon.

ROYAL CANADIAN NAVY.

CANADIAN DESTROYERS CRUISE.—For the first time, the two destroyers of the Royal Canadian Navy from either seaboard cruised in company with an Imperial cruiser during the past quarter. The " Champlain," Commander V. G. Brodeur, arrived at Bermuda from Halifax on 10th January. The " Vancouver," Lieutenant-Commander R. W. Wood, arrived there on 21st January, having left Esquimalt on 30th December, and called at San Pedro, Manzanilla and Balboa. The vessels left Bermuda on 3rd February, in company with the " Durban," Captain R. Leatham, for a cruise to Nassau, Havana, Miami, Montego Bay, and Kingston, Jamaica. The " Champlain " and " Vancouver " returned to Halifax and Esquimalt respectively on 15th and 17th April.

ROYAL INDIAN MARINE.

NEW SLOOP.—The new sloop being constructed by Messrs. Swan, Hunter and Wigham Richardson, Ltd., for the Government of India will be known as H.M.I.S. " Hindustan."

FOREIGN NAVIES

ARGENTINA

ESTIMATES.—As the Estimates for 1930 could not be completed in time to be submitted to Congress, a decree was passed prolonging those for 1929 over 1930.

New construction is provided for by special law, and is not included in the Estimates. In 1926, Congress voted £15,000,000 for new construction, the sum to be spread over ten years. The first quota of £7,000,000 has been spent, but so far there are no indications of further expenditure.

CHILE

NEW SUBMARINE DEPOT-SHIP.—The submarine depot-ship, " Araucano," left Barrow on 22nd February for trials on the Clyde. On their successful completion, she was handed over to Admiral Luis Escobar, Chief of the Chilean Naval Commission in England.

Built by Vickers-Armstrongs, Ltd., the "Araucano" is of 4,000 tons, and is fitted with geared turbines to develop 2,500 h.p. The ship is 390 ft. long, and her mean speed is 13 knots. She carries supplies of oil fuel and battery-charging apparatus for submarines, and also has workshops for running repairs, spare torpedo body and head stowage, and accommodation for submarine officers and men. Special attention has been paid to the lifting appliances for transferring quickly stores, torpedoes, and spare parts of machinery to and from the submarines when moored alongside the depot ship.

BRITISH NAVAL MISSION.—Captain W. L. Jackson, D.S.O., has been lent for duty under the Chilean Government, as from 27th March, in succession to Commander F. H. Pegram, as Head of the British Naval Mission.

CHINA

NAVAL MISSION.—A Naval Mission to study navies abroad has been appointed by the National Government, with a view to effecting a complete re-organization of the Chinese Navy. Headed by Admiral Tu Hsi-Kuei, a one-time Premier of the Northern Government and C.-in-C. of the Northern Navy, the Mission arrived in England on 6th February. Admiral Tu had the honour of being received by H.M. the King, and he had interviews with the Prime Minister, the First Lord and the First Sea Lord.

The Mission has visited Portsmouth, Plymouth, Dartmouth, Greenwich, and the Works of Messrs. Vickers-Armstrongs at Barrow and Erith.

NEW GUNBOATS.—The gunboat "Min Chuan" carried out trials in the latter part of January.

A gunboat, which is very much larger than any at present possessed by China, is to be built by the Kiangnan Dock and Engineering Works at Shanghai. It will be called the "Yat Sen."

COLOMBIA

NEW GUNBOATS.—The British Admiralty have agreed to afford technical supervision for the building of three gunboats for the Government of Colombia by Messrs. Yarrow & Co., Scotstoun. The gunboats will be 140 ft. long, and equipped with internal combustion engines, giving a speed of 13½ knots. The Colombian Navy already includes four small Yarrow-built motor launches or "guardacostas," but its two principal gunboats, the "Esperanza" and "General Nerino," were built in the United States; and there are also three patrol craft launched at Rouen, France, in 1925.

DENMARK

General uncertainty still prevails as to the future of the Danish Navy, as the proposals to reduce it to a "State Navy" mainly for pacific duties is still engaging the spasmodic attention of Parliament.

Meanwhile, the Naval Estimates for 1929–30 amount to £1,240,100, as compared with £1,228,200 last year. The strength of the fleet remains the same, except that the old coast-defence ship, "Skjold," has been placed on the sale list, and a new fishery inspection ship and two sailing training ships have been commissioned.

Torpedo boats "Laxen," "Dragen" and "Hvalen," are due for completion by the Copenhagen Dockyard during the year.

FRANCE

A General Review.

The French Navy, during the tenure of Monsieur Leygues at the Ministry of Marine, has enjoyed a continuity of policy which it had not known prior to his arrival in the Rue Royal in 1922. A thorough overhaul of naval administration has been in progress for the past two or three years, while naval matters have received exceptional publicity in the light of the London Conference.

Reviewing the progress made, M. Leygues said, in a speech delivered on 1st January, that the recent growth of the French Navy made it possible to establish permanent overseas squadrons. Four such squadrons would be formed early in 1930, in the Pacific, Indian Ocean, West Coast of Africa, and the West Indies.

New Minister of Marine.—In the Cabinet formed by M. Tardieu on 2nd March, the portfolio of Minister of Marine was taken by M. J. L. Dumesnil, who was the author of the Report on Naval Estimates for this year's Budget. He was Minister of Marine under M. Herriot in 1924–25. There was widespread regret in naval circles at the departure from the Admiralty of M. Leygues, who, at two different times since the war, has been seven years in office, and has devoted himself whole-heartedly to the rebuilding of the French Navy.

New Flotilla Leaders.—On 1st February the flotilla-leader " Vauban " was launched at Dunkirk by M. Deligne, then Under-Secretary for the Navy. The vessel took the water in an advanced state of construction, with funnels and much other equipment on board. By the summer, France should have six flotilla leaders of this type, of 2,436 tons, 36 knots, and carrying five 5.5-in. guns, in commission—the most powerful flotilla-leader division in the world.

Leader's Record Speed.—In the course of her trials on 8th February, the flotilla-leader " Bison " is reported to have attained a record speed of 41.2 knots, as compared with the former record of 40.118 knots, set up by her sister ship, the " Verdun." On 12th February, the Admiral Commanding at Lorient announced officially that, while the " Bison " had attained a record speed, the figures published were not accurate. The exact figures were being kept secret, by order of the Ministry of Marine, until the end of the London Naval Conference.

Battleship Re-Conditioning.—The " Paris," having been re-conditioned, has relieved the " Lorraine " in the 1st Squadron. The " Lorraine " has been taken in hand. The " Courbet " is nearly completed, but the " Jean Bart " is not expected to be ready before January, 1931.

Battleship Report Denied.—On 23rd April, the Ministry of Marine issued the following statement :—" Several British quarters have published statements, according to which there is some question of laying down a 23,000-ton ' cruiser ' in France. The Ministry of Marine wishes to say that these statements are wholly inaccurate."

Launch of the " Jeanne d'Arc."—The training cruiser " Jeanne d'Arc " was launched at St. Nazaire on 14th February. She will have accommodation for 20 instructional officers and 156 cadets, in addition to her own complement.

GERMANY

The New Fleet.

Germany is rapidly building up a small but efficient fleet, the units of which represent the last word in scientific development and mechanical ingenuity.

Work is progressing on the 10,000-ton battleship, " Ersatz Preussen," and a sum of R.M. 11,620,000 has been authorized for this charge in the 1929–30 Estimates. The ship is due for completion in 1932. No provision has, however, been made for a second ship in this year's Budget. This may be attributed partly to financial stress and partly to party tactics.

The old battleship " Hanover " is being modernized by the replacement of her 6.7-in. with more modern 5.9-in. guns, and by fitting a new type of mast with up-to-date fire control outfit, as has been done in the case of the " Schleswig Holstein " and " Schlesien."

With the launching of the " Leipzig," Germany has five modern cruisers built up to the tonnage allowed by the Versailles Treaty. Actually, the Treaty allows a sixth cruiser, but the personnel permitted is not adequate for manning an additional ship as well as the coast defences.

The series of twelve new destroyers is complete, while most of the earlier destroyers and torpedo-boats have been reconditioned.

A number of old cruisers and ineffective torpedo craft have been removed from the fleet.

CRUISE TO THE MEDITERRANEAN.—On 8th March, the Reichstag Budget Committee, at the instance of the Ministry for National Defence, voted extra expenditure of £10,900 for a Mediterranean cruise (the first since the war), of a squadron, consisting of four battleships, a cruiser, and nineteen torpedo-boats. About eighteen Mediterranean ports will be visited. The cruise is described as necessary for training, which it is difficult to carry out satisfactorily early in the year in German home waters owing to weather conditions. The cruise is to last about two-and-a-half months.

BRITISH ATTACHE'S VISIT.—Attention was called in the German Press on 23rd April to the first formal visit by a British Naval Attaché to the German Fleet since the war. On 22nd April, Commander M. A. Hawes, R.N., was taken round Wilhelmshaven Dockyard, and also went on board the German cruiser " Köln," just back from a Baltic cruise.

ITALY

LAUNCH OF FIVE WARSHIPS ON ONE DAY.—The conclusion of the Naval Conference seems to have been the signal for putting afloat simultaneously five additions to the Italian Fleet. These were :—

(i) The 10,000-ton cruiser " Zara," at Spezia.
(ii) The 10,000-ton cruiser ' Fiume," at Trieste.
(iii) The 4,896-ton cruiser " Giovanni della Bande Nere," at Castellamare.
(iv) The 4,896-ton cruiser " Alberto di Guissano," at Genoa.
(v) The 810-ton submarine " Delfino," at Monfalcone.

All these were launched on Sunday, 27th April.

NEW CONSTRUCTION PROGRAMME.—On 30th April, it was announced that the Cabinet had decided to lay down the following new vessels during the coming year :—

One cruiser of 10,000 tons.
Two scout-cruisers of 5,100 tons each.
Four destroyers of 1,240 tons each.
Twenty-two submarines, four of 1,390 tons, six of 810 tons, and twelve of 610 tons.

The total amount of new tonnage provided for in the Programme is thus 42,900. This compares with the provision of 42,070 tons in the previous year.

FLOTILLA LEADER'S TRIALS.—During trials off Ancona on 5th April, the flotilla leader "Nicoloso da Recco," one of a class of twelve laid down in 1927, reached a speed which was claimed as a world's record, by attaining 41.504 knots. In her first test, the new Italian vessel steamed for six hours, and comfortably exceeded the contract speed of 38 knots. The record was created in a subsequent test.

NORWAY

RE-ORGANIZATION.—The scheme of re-organization of the Navy came into force on 1st January last. It is hoped to commence a programme of new construction, which will provide Norway with the modern ships she requires.

ESTIMATES.—The sum voted for naval expenditure in 1929–30 is approximately £662,000, as compared with £686,000 for the previous year.

SIAM

NEW GUNBOAT.—The gunboat "Sukhodaya" has been completed by Vickers-Armstrongs, Ltd., and left Barrow on 17th March for Siam. She is a steel twin-screw ship, 173 ft. long, and has an armour belt of nickel steel fitted for her full length, with armoured bulkheads and screens. The upper deck has heavy steel protection against aircraft. The vessel carries two 6-in. and four 3-in. A.A. guns. Her two triple expansion engines develop 850 h.p.

SPAIN

NEW CONSTRUCTION.—The following is the situation as regards new construction for the Spanish Navy:—

(*a*) *Battleships.*—The Minister of Marine has stated that it is unlikely that any new battleships will be built for some time; on the other hand, preparations are being made at Cartagena for the construction of a dry dock large enough to take a 35,000-ton battleship. Also at Ferrol the building slips have been lengthened. This work has been done by a commercial shipbuilding company, and it is unlikely that such an outlay would have been made unless it were probable that there would be a satisfactory return in the future.

(*b*) *Cruisers.*—Two 10,000-ton cruisers are under construction at Ferrol; one is due to be launched in 1930 and the other in 1931. The 7,800-ton cruiser "Miguel de Cervantes" commenced her trials in November last, and should complete in the summer of the present year.

(*c*) *Destroyers.*—A building programme of eight destroyers and a parent ship for submarines was approved in August last.

OFFICERS.—Early in the year, decrees were issued whereby the number of Flag Officers is reduced from 24 to 18, and that of Captains from 48 to 42. In the non-executive branches, ranks corresponding to those of Vice and Rear-Admiral have been abolished, and the highest relative rank now is that of Captain. Small increases are authorised in the numbers in the junior ranks of both executive and non-executive officers.

UNITED STATES

LAUNCH OF THE "CHICAGO."—On 10th April the "Chicago," the seventh of the eight 10,000-ton 8-in. gun cruisers authorized in 1924, was launched at the Mare Island Navy Yard.

NEW AIRCRAFT-CARRIERS.—According to the *Army and Navy Register* of Washington, the new aircraft-carrier will displace less than half the 35,000 tons of the "Lexington" or "Saratoga." The Navy Department publication, "Ship's Data of United States Naval Vessels," dated 1st July, 1929, states that the two "Lexingtons" can each accommodate the following:—3 cabin officers, 94 wardroom officers, 78 junior officers, 20 warrant officers, 101 chief petty officers, and 1,826 other enlisted men, a total commissioned and enlisted personnel of 2,122. For the new 13,600-ton carrier, the proposed numbers are:—45 ship's officers, 114 naval aviators (commissioned officers), 36 enlisted pilots, 313 aviation ratings (including 36 enlisted pilots), and 1,018 other enlisted ratings, bringing the total of enlisted men up to 1,331, and the total commissioned and enlisted complement up to 1,526.

NEW FLEET SUBMARINES.—Submarine "V.6" was launched at Mare Island Navy Yard, California, on 15th March. Submarine "V.5" was launched at the Portsmouth Navy Yard on 17th December, 1929. These are the first of a new type of "fleet cruiser" submarines, of 2,760 tons, 6,000 horse-power, 17 knots speed, and an armament of two 6-in. guns and six torpedo tubes. Each carries eight officers and eighty men, and has a cruising radius reputed to be 20,000 miles. "V" 1, 2, and 3 are "fleet submarines, first line," of 21 knots speed; and "V.4" is a "fleet submarine minelayer," of 15 knots.

YANGTSE CAMPAIGN MEDAL.—On 27th January, the Secretary of the Navy authorized the issue of a "Yangtse Campaign Medal," to commemorate the services rendered by the naval forces in the valley of the Yangtse River in protecting American lives and property. The medal will be distinctive in design, and will be issued to the officers and men of the Navy and Marine Corps who served at Shanghai and in the Yangtse Valley between 3rd September, 1926, and 21st October, 1927. The former date was the first occasion upon which a naval vessel of the United States was fired upon by armed Chinese forces while employed on patrol duty protecting ships engaged in up-river commerce. The latter date was that of the last occasion of the kind.

ARMY NOTES

HOME

Extracts from the Memorandum of the Secretary of State for War relating to the Army Estimates for 1930.

The Army Estimates for 1930 include provision for the excess cost arising from the employment of additional troops in China which has hitherto been met by Supplementary Estimates. Two other new features are the loss of the receipts in connection with the Army of Occupation on the Rhine (£950,000)—the loss of which for part of 1929 amounts to £560,000, provided in the Supplementary Estimate recently presented—and the omission of the contribution from the Government of Egypt towards the cost of maintenance of British troops in Egypt in consequence of the initiation of negotiations for a treaty with that country (£150,000).

The amount which I ask the House to vote for 1930 is £40,500,000; this has to be compared with the sums provided for 1929 both in normal Estimates (£40,545,000) and in the Supplementary Estimate (£560,000), or a total of £41,105,000. The saving of £605,000 is the measure of the care with which each item of expenditure was scrutinized by the Army Council, and of the economies achieved by their collaboration.

Establishment and Distribution of the Regular Army.—The total of Vote A is 148,900 as compared with 150,500 in 1929, the decrease of 1,600 being mainly accounted for by :—(*a*) reductions in administrative services in consequence of the withdrawal of the British Army of the Rhine from the occupied territories; (*b*) the completion of the disbandment of horse transport companies, Royal Army Service Corps; (*c*) a diminution of the additional numbers required on account of troops employed in China; (*d*) reduction resulting from the continuous revision of Army establishments.

On the withdrawal of the troops of the British Army of the Rhine, the two brigades have been incorporated into a division which has been formed at Catterick Camp.

The forces in China have been reduced by one battalion; this has enabled Gibraltar to be brought to its normal establishment. On the other hand it is anticipated that the two battalions temporarily transferred from Malta to Palestine will remain there for the present.

The conversion of the 12th Royal Lancers in Egypt into a Cavalry Armoured Car Regiment will be completed in the course of the year, and the policy of mechanization is being gradually extended.

Strength and Recruiting.—The strength of the British Army, inclusive of British troops in India, will be approximately 10,000 below establishment. The shortage, which is almost entirely in the Infantry of the Line at home, is due to the abnormal outflow in 1928 and 1929 and the small intake of recruits during the latter year.

The recruits obtained during the year 1929 may not exceed 26,000 as against 30,000 in 1928. For 1930 an intake of 28,500 has been allowed for, but this will not suffice to make good the shortage. The position, therefore, gives cause for some disquietude, as the lowering of the dental and height standards which will have admitted into the Army some 3,000 men during the year, who otherwise would have been rejected, cannot be carried further.

ARMY AND SUPPLEMENTARY RESERVES.—The strength of the Army Reserve on 1st April will be approximately 125,000, an increase of over 16,000 during the past year; in 1930 the number will rise to 132,000, but before the end of the year the strength will begin to decline, as the number of reservists completing their engagements will exceed the number due to leave the colours, and on 1st April, 1931, it is expected to be about 129,000.

The strength of the Supplementary Reserve, which exists primarily to supply certain technical personnel not produced by regular peace establishments, will be approximately 16,000 on 1st April, 1930, and may reach 20,500 by the end of the year.

VOCATIONAL TRAINING AND EDUCATION.—During 1929, 2,193 soldiers passed through the Army Vocational Training Centres, and of these some 76 per cent. obtained employment immediately on completion of their training. The corresponding figures for 1928 were 1,598 and 81.5 per cent. The scheme under which 500 soldiers serving in India come home annually for courses at Vocational Training Centres continues to work well. In addition about 350 vacancies were allotted this year to soldiers serving at colonial stations whose service is about to expire, and these have all been filled.

Efforts are being made to improve the machinery for placing ex-soldiers in civil employment by co-ordinating the activities of the various regimental and voluntary organizations interested in this work, and to impress on all soldiers the importance of taking steps some time before they leave the colours to secure civil employment.

Owing to the suspension of assisted passage schemes to Australia, oversea settlement of ex-soldiers has received a set-back, but fifty-one single men are at present under training at Chisledon for settlement in Canada, and it is hoped that about twenty-five families trained at Chisledon will be placed in Canada under one of the transportation companies' schemes.

Great attention has been paid in all branches of the army to physical training, and the effect of modern methods has been to quicken the receptive power of the mind of men under training, as well as to promote their muscular development.

Education, carried out by the Army Educational Corps, with the assistance of regimental officers and N.C.O's. of all branches of the Army, is recognized as an integral part of military training and has for its objects to quicken the intelligence of the soldier so that his training in his purely military duties is greatly facilitated, and to improve his prospects of employment when he returns to civil life.

HEALTH OF THE ARMY.—Although the troops, in common with the civil population, suffered somewhat severely from influenza during the earlier months of the year, the health of the army has been satisfactory. A permanent reduction of 175 equipped beds in military hospitals was made in consequence of the evacuation of the Rhineland.

TERRITORIAL ARMY.—The strength of the Territorial Army (exclusive of Permanent Staff) on 1st January, 1930, was 6,864 officers and 129,066 other ranks,

a decrease of 68 officers and 3,378 other ranks as compared with 1st January, 1929. The number of recruits in 1929 was 28,266 against 29,193 in 1928.

The decrease in establishment, consequent upon the re-organization of infantry battalions takes effect this year and involves a total reduction of some 8,700 men.

Authority has been given for the mechanization of Divisional Artillery Brigades in cases where it is desired; Medium and Army Field Brigades will all be mechanized during the year; and Divisional Signals units are being allowed to mechanize if they so desire.

Special measures are in contemplation for emphasizing during the next training season the close connection of the Regular and Territorial Armies; units of the Territorial Army will have the assistance of Regular Army formations and units, and arrangements have been made for the holding of joint Regular and Territorial Army Camps during the summer.

There has been a revision of clothing grants due to a fall in prices and the withdrawal of steel helmets, and the reduction of 4s. made in the grant in 1926 has been reintroduced. A scale of grants has been fixed for mechanical vehicles, and certain adjustments have been made in the stocks of clothing held by County Associations.

The four Peerless Armoured Cars at present in possession of Armoured Car Companies will be withdrawn. They will be replaced by two Rolls Royce Armoured Cars a company before the commencement of the training season, and a pool of twelve Rolls Royce Armoured Cars will be available to supplement them at camp.

Camp was attended in 1929 by 5,898 officers and 113,215 other ranks (exclusive of Permanent Staff); the corresponding figures for 1928 were 5,882 officers and 117,449 other ranks.

The Cadet Force on 31st October, 1929, consisted of 965 companies with a strength of 2,391 officers and 48,352 other ranks as compared with 935 companies, 2,348 officers and 49,014 other ranks in 1928. 1,151 officers and 18,333 other ranks attended camp in 1929, and 1,678 cadets or ex-cadets are known to have joined His Majesty's Forces within the twelve months ending 31st October, 1929.

TRAINING.—In 1930 the various experiments which have been carried out during 1929 will be continued, certain modifications in organization being made in accordance with experience gained.

The 6th and 7th Infantry Brigades will continue to be Experimental Infantry Brigades.

The 1st and 2nd Divisions will carry out their training at Aldershot. In September the 1st Division, accompanied by the 1st Cavalry Brigade, will move to Salisbury Plain for further divisional training to afford these formations an opportunity of training on different ground with the minimum of expense. Owing to the necessity for economy the 3rd Division will not be concentrated this year for training.

It is proposed to concentrate in Norfolk and Suffolk the 4th Division which did not train in 1929, and in order to combine the maximum of efficiency in training with the minimum inconvenience to all concerned, the Manœuvres Acts will be put in force in the selected area.

WORKS SERVICES.—The return of the troops from the Rhine has necessitated provision being made in 1930 for certain new services at Catterick. At Singapore the provision for 1930 is only sufficient to meet outstanding liabilities and to

complete work which, if left unfinished, would involve loss to the public through deterioration; all other work has been suspended.

In continuing the programme of the modernization of barracks, priority has been given to sanitary services, the provision of recreation establishments and dining rooms for the rank and file, to improvements in married quarters, long overdue, and to structural alterations to hutted camps which will increase the comfort of the troops. The progressive deterioration of war-time hutted camps renders unavoidable the replacement of those buildings, further repairs to which would be uneconomical. The provision made this year can, however, only be regarded as an instalment of what will be required under this head. The installation of electric light in barracks should be almost completed in 1930.

ARMAMENTS AND RESEARCH.—Steady and substantial progress has been made in improving the accuracy and effectiveness of anti-aircraft artillery, in the evolution of bridging equipment, in facilitating wireless communication between moving vehicles, in the development of mechanized anti-tank guns, and in the consideration of the experience gained by research and in field trials of the varied and complex problems of mechanization. In another sphere there has been devised a much improved form of mechanized cooking apparatus.

Although the strictest economy has been practised in the past year, research and experiments have led to a notable advance in providing small mechanical vehicles to replace the light draught-horse, of which the supply is steadily diminishing, and to the improvement of cross-country vehicles of the latest types. There is ample evidence that types of vehicles evolved by the Army are making transport possible in places hitherto inaccessible, thus contributing to the commercial development of the resources of the Empire.

REGULAR FORCES

APPOINTMENTS AND PROMOTIONS.—His Majesty the King has been pleased to approve of the following appointments:—Colonel G. H. N. Jackson, C.B., C.M.G., D.S.O., and Colonel (temporary Brigadier) William Marshall Fordham, C.B., C.B.E., Indian Army, as Aides-de-Camp to the King. Colonel George Herbert Stobart, C.B.E., D.S.O., Territorial Army, Honorary Colonel of the 6th Battalion (Territorial) The Durham Light Infantry (Lieutenant-Colonel, retired pay, late Royal Artillery), as Aide-de-Camp to the King, "additional."

Colonel C. L. Isaac, T.D., M.B., F.R.C.S., Assistant Director of Medical Services, 53rd (Welsh) Division, Territorial Army, as Honorary Surgeon to the King.

Lieutenant-General Sir Webb Gillman, K.C.B., K.C.M.G., D.S.O., as Colonel Commandant, Royal Artillery; Lieutenant-General Sir Edwin H. de V. Atkinson, K.C.B., K.B.E., C.M.G., C.I.E., as Colonel Commandant, Royal Engineers; Major-General Sir Wilkinson D. Bird, K.B.E., C.B., C.M.G., D.S.O., as Colonel of The Queen's Royal Regiment (West Surrey).

General Sir Philip W. Chetwode, Bart., G.C.B., K.C.M.G., D.S.O., A.D.C. General, on assuming the appointment of Commander-in-Chief in India on 3rd July will be succeeded as Chief of the General Staff in India by Lieutenant-General Sir C. J. Deverell, K.C.B., K.B.E., at present Quartermaster-General in India. Lieutenant-General Deverell will hold his new appointment until 24th February, 1931, the date on which his appointment as Quartermaster-General would expire.

Lieutenant-General A. E. Wardrop, C.B., C.M.G., will become Quartermaster-General in India on 3rd July of this year.

The following appointments have been announced: Major-General E. Evans, C.B., C.M.G., D.S.O., to be Major-General in charge of Administration, Aldershot Command; Major-General F. J. Marshall, C.B., C.M.G., D.S.O., to be Commander, 54th (East Anglian) Division, Territorial Army, in succession to Major-General Sir Torquhil G. Matheson, K.C.B., C.M.G., who will vacate the appointment in the early autumn; Major-General R. J. T. Hildyard, C.B., C.M.G., D.S.O., to be Commander, 43rd (Wessex) Division, Territorial Army, in succession to Major-General Sir George D. Jeffreys, K.C.V.O., C.B., C.M.G., whose tenure of that appointment expires on 1st October next.

Major-General D. Deane, C.B., D.S.O., has been appointed Military Secretary, India Headquarters Staff.

Major-General J. A. Hartigan, C.M.G., D.S.O., M.B., K.H.P., to be Deputy-Director of Medical Services, Aldershot Command.

The tenure by Major-General J. R. E. Charles, C.B., C.M.G., D.S.O., as Director of Military Operations and Intelligence, has been extended until 1st February, 1931, when he will be succeeded by Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., who will not vacate his post as Commandant of the Imperial Defence College until 1st January, 1931.

Brigadier C. M. Wagstaff, C.M.G., C.I.E., D.S.O., A.D.C., has been selected for the appointment of Commandant of the Royal Military Academy at Woolwich, in succession to Major-General H. D. De Prée, C.B., C.M.G., D.S.O., whose tenure of that appointment expires on 16th July, 1930.

Colonel (temporary Brigadier) J. G. Dill, C.B., C.M.G., D.S.O., has been selected as Commandant of the Staff College, Camberley, in succession to Major-General C. W. Gwynn, C.B., C.M.G., D.S.O., who will vacate that appointment in January next on the completion of the instructional year.

The following promotions have been made: Major-General Sir John Theodosius Burnett-Stuart, K.B.E., C.B., C.M.G., D.S.O.; Major-General Sir Walter Stewart Leslie, K.B.E., C.B., C.M.G., D.S.O., to be Lieutenant-Generals.

Colonel (temporary Brigadier) C. J. C. Grant, C.B., D.S.O.; Colonel J. E. S. Brind, C.B., C.M.G., D.S.O., A.D.C. to the King; Colonel R. D. F. Oldman, C.B., C.M.G., D.S.O., A.D.C. to the King; Colonel J. T. Dreyer, C.B., D.S.O., to be Major-Generals.

Colonel J. A. Hartigan, C.M.G., D.S.O., M.B., K.H.P. (late R.A.M.C.), to be Major-General, in succession to Major-General J. S. Gallie, C.B., C.M.G., D.S.O., K.H.S.

Colonel (temporary Brigadier) B. R. Moberly, C.B., D.S.O., Indian Army, to be Major-General.

CHAPLAIN COMMANDANT.—The King has approved of the appointment of a Chaplain Commandant of the Royal Army Chaplains' Department. His status and duties will correspond with those of colonels commandant of other corps. He will maintain a close connection between the Regular, Territorial and Reserve Chaplains and establish a liaison with the Army Chaplaincy Services in the Dominions.

The Rev. J. D. S. Parry-Evans, C.M.G., C.B.E., K.H.C., Assistant Chaplain General, Aldershot Command, is to be the first Chaplain Commandant.

CAVALRY FACINGS.—The King has approved of the undermentioned amalgamated cavalry regiments adopting the facings, etc., here shown :—

3rd Carabiniers (Prince of Wales's Dragoon Guards).—Uniform—*scarlet.* Facings—*yellow.* Plume—*black and red.*

4th/7th Dragoon Guards.—Uniform—*scarlet.* Facings—*Royal blue.* Plume—*white.*

5th Inniskilling Dragoon Guards.—Uniform—*scarlet.* Facings—*primrose.* Overalls—*green.* Plume—*red and white.*

13th/18th Hussars.—Uniform—*blue.* Collar—*buff.* Busby-bag—*buff.* Plume—white.

14th/20th Hussars.—Uniform—*blue.* Busby-bag—*yellow.* Plume—*white.*
15th/19th Hussars.—Uniform—*blue.* Busby-bag—*scarlet.* Plume—*scarlet.*
16th/5th Lancers.—Uniform—*scarlet.* Facings—*blue.* Plume—*black.*
17th/21st Lancers.—Uniform—*blue.* Facings—*white.* Plume—*white.*

DEFINITION OF "RETIREMENT" AND "RESIGNATION."—New articles defining the expressions "Retirement" and "Resignation" have been added to the Royal Warrant for the pay, appointment, promotion and non-effective pay of the Army :—

"Retirement" refers to the case of an officer eligible by length of service for retired pay or gratuity. In the case of retirement the officer retains his commission.

"Resignation" refers to the case of an officer—(i) leaving the Army before he is eligible by length of service for retired pay or gratuity ; (ii) refused permission by the Army Council to retire.

In either case the officer ceases to hold a commission and is under no obligation to serve in the Reserve of Officers.

SUBSIDIES FOR MECHANICAL TRANSPORT : WAR OFFICE SCHEME.—Attention is drawn to the scheme for subsidizing motor vehicles, and applications are invited to fill vacancies. Vehicles eligible for the subsidy are rigid framed six-wheeled vehicles built to the War Department chassis specification. They are equipped with pneumatic tyres and are of the following makes and types :—"Albion" (S.K.31) ; "Crossley" (I.G.L.3) ; "Guy" (B.A.X.) ; "Karrier" (W.O.6), (R.M.6), and (F.M.6) ; "Leyland" (Terrier) ; "Thornycroft" (A.3) and (A.5).

A vehicle of each type has been submitted to exhaustive tests as to stability and performance, under War Department scrutiny, to ensure reliability under all conditions of service. Owing to their capacity for cross-country work, the vehicles are particularly suitable for loading on almost any condition of ground, thus saving double handling of the load. Detailed particulars of the vehicles may be obtained from the makers. Practically any type of goods-carrying body is acceptable ; but where special trade requirements necessitate an abnormal body, the chassis can be enrolled without the body.

The subsidy agreement gives the War Department a right to purchase the vehicle if it is required during a national emergency. There is no obligation to hire to the Department at any time.

The subsidy offered is £120 payable half-yearly in advance by six instalments, the first being paid on enrolment. A vehicle being acquired by hire purchase can be enrolled under the scheme ; in this case the agreement provides for the subsidy paid to the legal owner being credited to the hire-purchaser as received.

TERRITORIAL ARMY

"DARTMOUTH CUP" COMPETITION RESULT.—The winners of the "Dartmouth Cup" Competition for 1929 are the 4th Battalion The Northamptonshire Regiment, with the figure of merit, 99.8. This Battalion tied for first place in 1928.

The following units had figures of merit of not less than 90 :—

5th Battalion The Somerset Light Infantry	99.7
1st Battalion The Hertfordshire Regiment	99.7
The Hallamshire Battalion The York and Lancaster Regiment	99.7
6th Battalion The Cameronians	99 7
16th London Regiment	99.4
11th Brigade, Royal Horse Artillery	99.3
Lancashire and Cheshire Heavy Brigade, Royal Artillery	99.3
71st Field Brigade, Royal Artillery	99.2
5th/6th Battalion The Argyll and Sutherland Highlanders	98.9
Suffolk Heavy Brigade, Royal Artillery	93.8
1st Battalion The Cambridgeshire Regiment	91.8
6th/7th Battalion The Black Watch	91.8
92nd Field Brigade, Royal Artillery	90.3

The Cup was presented by the Rt. Hon. the Earl of Dartmouth in 1925 to be competed for annually by units of the Territorial Army. The conditions governing the competition for the Cup may be varied from year to year, but it was decided for the year 1929 again to award the Cup for proficiency in signalling in Yeomanry, Artillery and Infantry units of the Territorial Army. The proficiency of each unit competing was assessed by means of a figure of merit based on the results of the annual classification of the unit signallers.

TERRITORIAL ARMY RIFLE ASSOCIATION.—Field-Marshal Sir Claud W. Jacob, G.C.B., K.C.S.I., K.C.M.G., has consented to become President of the Territorial Army Rifle Association in succession to the late General Sir Charles C. Monro, Bart., G.C.B., G.C.S.I., G.C.M.G.

DOMINION FORCES

REGIMENTAL ALLIANCES.—The King has approved of the following alliances :—

3rd Mounted Rifles (Natal Mounted Rifles) Active Citizen Force, Union Defence Forces, to 3rd The King's Own Hussars.

2nd Infantry (Duke of Edinburgh's Own Rifles), Active Citizen Force, Union Defence Forces, to The Wiltshire Regiment (Duke of Edinburgh's).

The Royal Montreal Regiment, Non-Permanent Active Militia of Canada, to the 14th Battalion, Australian Military Forces, and The Waikato Regiment of the New Zealand Military Forces.

3rd Battalion, Australian Infantry, Australian Military Forces, to The Buffs (East Kent Regiment).

Ceylon Supply and Transport Corps, to the Royal Army Service Corps.

The Royal Canadian Army Veterinary Corps, Permanent Active Militia of Canada, and the Canadian Army Veterinary Corps, Non-Permanent Active Militia of Canada, being allied to the Royal Army Veterinary Corps.

CANADA

MECHANIZATION.—The Royal Canadian Horse Artillery, Permanent Force, is to be mechanized, and officers and men are now passing through courses of instruction. Existing establishment consists of Headquarters and three batteries.

THE WOLFE MEMORIAL.—The unveiling of a memorial to General Wolfe at Greenwich Park, on 5th June, by the Marquis de Montcalm, a direct descendant of the General's opponent, will crown an effort upon which the Canadian people have been engaged for years in order to pay adequate tribute to his memory. Money for the memorial has been subscribed in the Dominion and the required sum was obtained some considerable time ago. Since then negotiations have been continuing on many difficult points connected with the erection of the statue. The fact of Greenwich Park being part of the Royal domain involved discussions and difficulties which would not have arisen in the case of a normal site, while the form of the statue itself engaged the serious attention of experts for many months. Executed by Professor Tait Mackenzie, it is regarded as one of that master's finest works, and represents Wolfe contemplating the Heights of Abraham just before coming to his historic decision. The statue is accurate in every detail, the actual cloak having been copied and his features modelled from authentic busts and portraits. Much of the credit for the completion of the work and for the satisfactory settlement of all difficulties belongs to the late Hon. P. Larkin, who, as a member of an active committee on this side, was untiring in his effort to bring the matter to a successful conclusion. The Government of Canada will be represented at the unveiling ceremony by Mr. Philippe Roy, Canadian Minister to France.

FOREIGN

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BELGIUM

DRESS REFORM.—A commission under General Kempeneer, *Directeur du Personnel*, has been appointed to study the dress of the army. There is a general feeling among the senior officers of the army that there is need for a full dress uniform of some other colour than khaki. According to the press the commission has recommended a blue uniform.

BOLIVIA

BOUNDARY DISPUTE WITH PARAGUAY.—A skirmish has again occurred in the Chaco between Bolivian and Paraguayan troops, in the neighbourhood of Fort Boqueron. Although apparently there was only one casualty on each side, the situation has been aggravated by the alleged interception by Paraguay of a wireless message ordering the 4th and 5th Divisions of the Bolivian Army to call up volunteer reservists and to prepare for a general offensive.

Since then, however, a further message countermanding these moves is said to have been intercepted. Both countries have protested to the League of Nations.

It would appear, therefore, that the work of the Commission of Investigation and Conciliation, set up last year by the Pan-American Arbitration Conference to settle the incidents which occurred in December, 1928, has had little effect, although both countries agreed to its recommendations. The situation is distinctly critical, in spite of the many powerful influences at work to prevent war, and in spite of the fact that both countries have signed the Kellogg Pact. The chief danger lies in the excitable temperament of the people of Bolivia which might at any moment result in some precipitate act of aggression committed against the better judgment of her rulers.

The boundary question still remains unsettled, although the Commission of Investigation and Conciliation has made further proposals to the Bolivian Government in this respect, to which so far she has not replied. Previously she

had declared that she preferred to arrange this matter direct with Paraguay. The crux of the dispute is the question of the possession of the port of Bahia Negra, on the Paraguay River, which Paraguay on the one hand has categorically refused to give up, and which Bolivia on her part demands as an outlet to the Atlantic.

An additional complication in the present troubled state of affairs is to be found in the periodical quarrels between both countries and the Lengua Indians who inhabit portions of the disputed territory. Raids, and abduction of Indian girls, are carried out by both Bolivian and Paraguayan soldiery, resulting in loss of life and military equipment, since the Indians defend themselves against such incursions. The last fracas between Paraguay and the Indians has been amicably settled; but the latter are said to be most hostile at present to the Bolivians, who have not yet made amends for their latest raid.

CZECHOSLOVAKIA

DISCUSSION ON THE 1930 ARMY ESTIMATES..On 22nd January, Dr. Vysokvsky, Minister of National Defence, explained in Parliament why it has not been possible to carry into effect the law of 1920 which limited military service, from 1926 onwards, to fourteen months. His first point was that in 1926 no other nation had made any effort to reduce military service to as low a level as fourteen months. The Minister's next point was that there are not a sufficient number of long service non-commissioned officers, and that he himself favoured the idea of creating a corps of assistant-instructors, who in case of war would remain at depots and camps to train recruits and reservists. He proceeded to state that, if military service was to be reduced, units must be relieved of all duties unconnected with military training. This would necessitate the creation of a corps of civil watchmen and artificers, which in turn must entail increased expenditure. Further, the pre-military training of youths would have to be carried out more intensively than at present, in order to obviate the need to devote any portion of the fourteen months to physical training. Dr. Vyskovsky's conclusion was that a reduction of the period of service would almost certainly lead to increased expenditure.

MOROCCO

FRENCH ZONE : UNIFIED COMMAND ON THE ALGERIAN-MOROCCAN FRONTIER.—During the conference held last year between the Governor-General of Algeria and the Resident-General in Morocco, it was agreed that the only way to deal effectively with the sporadic outbreaks on the Algerian-Moroccan boundary, was to establish close liaison between the military forces of the two districts. Notwithstanding this liaison, incidents—such as that at Ait-Yacoub—continued to occur, and it has now been decided to institute a unified command in the area in question. This command will come under the Resident-General at Rabat and will include the districts of Colomb-Bechar and the Saoura. The commander will have at his disposal a certain number of troops, armoured cars, reconnaissance and bombing aviation squadrons, which will be drawn partly from Morocco, partly from Algeria. The strength of the forces has not yet been made public.

UNITED STATES

MECHANIZATION.—The hearings held by the Appropriations Committee of the House of Representatives indicate that considerable interest is being taken by the War Department in the matter of mechanized force and motorized transportation for the Army. This includes not only the highest cross-country fighting machine,

such as the tank, large and small, but motor equipment for the transportation of troops. Interesting experiments have been made in the transportation of cavalry troops and their mounts in order to determine whether it is feasible to move cavalry to distant points by motor whence they can disembark and carry on their cavalry manœuvres in the vicinity in which they are needed. It is still thought that the cavalry forms a necessary unit in the defence plan, and that this branch of the service has a definite service to perform, despite the improvements made from time to time in other methods of fighting.

When the Army Appropriation Bill was reported to the House this session it carried an item for the work of the mechanized force. During the discussion of the Bill before the Appropriation Committee an interesting evidence of the development along this line was demonstrated, when one of the so-called Christie tanks was brought to the Capitol in order to show members of Congress just what it was. This tank is a combination of rubber-tyred wheels and track that is said to be capable of making forty to fifty miles per hour in speed across flat fields with the track on, while along a road on the wheels it can make approximately seventy miles an hour. It seems the tests have not been thorough enough as yet to demonstrate the reliability of the machine, but enough has been indicated to justify further experimentation and test.

The report of the Appropriation Committee on the Army Appropriation Bill stated :—

> "Mechanized Force.—The Budget again fails to include any special provision for development and experimentation looking to motorization and mechanization of the Army. Progress in this direction in a greater degree is of prime importance in the judgment of the committee. . . . The Committee has added to the estimate for 'Ordnance service and supplies, Army,' $239,855 for the procurement of all the Ordnance items embraced on the list appearing in the statement referred to with the exception of the Christie tank, excluded for the following reason : the current appropriation carries $250,000 for the manufacture of between six and eight light tanks for service test. It now appears that a tank of greatly superior characteristics, particularly as to speed, is available. It is known as the Christie tank. The Ordnance Department would prefer to use the funds now available for purchasing a number of these Christie tanks for extended service test rather than the tanks it was first intended to manufacture. The committee favours that course. Such action will render it unnecessary to buy a Christie tank out of 1931 funds."

The number of matters pending before the Committee on Military Affairs has been such as to delay any active interest on the part of the committee in this very important work of the Army authorities. But it is to be hoped that in the near future sufficient time may be set aside to permit the members of the committee to inquire into just what is being accomplished. I believe this phase of national defence is important. A study is being advocated of the National Defence Act. This subject also should be given study by the Committee. General Williams, the Chief of Ordnance, has said : "Motorization is undoubtedly of paramount importance in the securing of modern day mobility for our Army." I feel members of Congress and the Military Affairs Committees in particular should have a thorough knowledge of the work being done, and I am sure it would be of great interest and value for the Committee of which I have the honour to be a member to give the subject some thought and study.—(*Army and Navy Journal of Washington, U.S.A., 22nd February*, 1930).

AIR NOTES

ROYAL AIR FORCE

Air Estimates.

The Air Estimates for 1930[1] total £17,850,000, as compared with £16,960,000 of 1929. The Estimates, as usual, include a grant in aid from the Admiralty in respect of the Fleet Air Arm. This amounts to £1,267,000 in 1930, as against £1,067,000 in 1929.

In introducing the Estimates in the House Mr. Montague, Under-Secretary for Air, remarked that the increase in the Estimates was mainly due to the provision of up-to-date equipment, the growing needs of civil aviation, and additional outlay on scientific research. He recalled that during the financial year five additional squadrons had been added to the Royal Air Force establishment for Home Defence, one being a regular squadron and the other four organized on the Cadre or Auxiliary basis, which meant that they were serving under conditions similar to those of the Territorial Army. It had originally been intended that 25 per cent. of the Home Defence Forces should be on this non-regular basis, but at present the proportion was much higher, for out of the existing 38 squadrons primarily provided for that service, 26 were regular squadrons and 12 of the Cadre or Auxiliary type.

Mr. Montague, in emphasizing the moderation and unprovocative character of British air policy and expenditure, remarked that our Air Force is substantially exceeded in terms of first line strength by France, Italy and the United States. Moreover, there was an actual reduction on the gross figures compared with the Air Estimates of five years ago, which was in striking contrast to the very large increase in the air expenditure of the other Powers during the same period. This, moreover, was despite the fact that our overseas requirements for garrison purposes in the Middle East and India in particular, are much greater than those of other countries. On the basis of metropolitan strengths we have considerably less than half-power standard compared with our nearest neighbours. In spite of these facts and figures, His Majesty's Government do not propose to deviate from the policy dictated by the firm intention not to be drawn into competition in armaments.

Appointments.

Air Commodore A. G. Board, C.M.G., D.S.O., to Station Headquarters, Heliopolis, 11th January; attached for temporary duty with Cape-Cairo Flight (1930).

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[1] Stationery Office, No. 85. 4/-.

Group Captains G. I. Carmichael, D.S.O., A.F.C., to Headquarters, R.A.F., India, 20th December, 1929; Supernumerary, on completion of course at Staff College, Quetta, pending posting to Iraq; R. E. C. Peirse, D.S.O., A.F.C., to Headquarters, R.A.F., Middle East, 6th January; attached for temporary duty as Chief Staff Officer; E. M. Murray, D.S.O., M.C., to R.A.F. Depot (Inland Area), 21st January; Supernumerary, whilst attending Senior Officers' Technical Course (Part II), at H.M. Dockyard, Portsmouth; L. A. Pattinson, D.S.O., M.C., D.F.C., to R.A.F. Depot (Inland Area), 29th January; Supernumerary, pending posting; on transfer to Home establishment.

Personnel.

Flying Training.—During the period 1st January, 1930, to 28th February, 1930, the following completed courses at Flying Training Units:—

	Officers.	*Airmen.*
C.F.S. Instructors' Courses (Short) ..	1	—
Refresher Course	1	—
No. 1 F.T.S.	28	4
No. 4 F.T.S.	12	15
Naval Officers	9	1
Auxiliary Air Force	1	—
Conversion Courses	1	1

Practice Camps.—R.A.F. Practice Camps will be opened again this year at North Coates Fitties, Catfoss and Sutton Bridge on 1st April, to provide facilities for exercising squadrons of the Inland Area and Air Defence of Great Britain Commands in air firing and bombing.

Cairo-Cape (1930) Flight.—A flight of four Fairey III "F" aircraft of No. 14 Squadron have carried out the annual service flight from Cairo to the Cape and return. The flight left Cairo on 11th January and returned on 24th February, and kept to schedule throughout. A flight of the South African Air Force accompanied the R.A.F. flight to Cairo on the return journey.

Naval Co-operation.

On the return to Portsmouth of H.M. Aircraft-Carriers "Furious" and "Argus" at the end of March from the Spring cruise with the Atlantic Fleet, all flights on board were disembarked to Gosport, except one from the "Argus," which disembarked to Lee-on-Solent.

Two flights were embarked in H.M.S. "Glorious" on 18th March, on that ship commissioning after being converted to an aircraft-carrier. The remaining flights were embarked from Gosport in April, when the ship proceeded with the Atlantic Fleet on the Summer cruise.

The flights embarked in H.M.S. 'Courageous" were disembarked at Gosport on the ship being taken into Dockyard hands.

(*See also* "Naval Notes," p. 423).

Organization.

The title of No. 501 (Bomber) Squadron has been changed to No. 501 (City of Bristol) Bomber Squadron, in order to show its territorial origin.

Pembroke Dockyard has been taken over from the Admiralty by the Air Ministry for gradual development as a R.A.F. Station.

A High Speed Section was formed with effect from 13th January last as part of the establishment of the Marine Aircraft Experimental Establishment, Felixstowe.

OVERSEAS COMMANDS

IRAQ

SITUATION IN THE SOUTHERN DESERT.—Sheiks Feisal ad Dawish, Naif Ibn Hithlain and Ibn Lami, the rebel leaders of the Akhwan, who recently surrendered to the Royal Air Force commander, have now been handed over to Ibn Saud, under certain conditions, which include an assurance that they would not be put to death. Their tribes, with their flocks, left Koweit, escorted by Armoured Car Sections of the Royal Air Force, and have now returned to Nejd.

(*See also* " INTERNATIONAL SITUATION," p. 409).

SUDAN

Further trials of aircraft fitted with float undercarriages were carried out in the Sudan during December and January. By fitting an improved type of propeller and floats, the difficulty of taking off, experienced during the earlier trials, was overcome, it being found possible to take off the aircraft fully loaded from calm water with no wind blowing. Considerable improvement was also noticed in the landing of the aircraft and the ease of control when taxying.

As a result of these trials, it is considered that the aircraft fitted with the new type of propeller and floats will prove quite suitable for operations over the river and those areas of the Sudan which are flooded between July and November each year.

TRANSJORDAN

A recrudescence of trans-frontier raiding between Transjordan and Nejd tribes occurred during the period under review. With the object of arresting the offenders and putting a stop to further raids, a force consisting of two troops of Transjordan Frontier Force in motor transport, six aircraft of No. 14 (B) Squadron and one section of Royal Air Force armoured cars has been formed, and is operating from a base in the desert.

Daily aircraft patrols are being maintained along the eastern and southern frontiers of Transjordan, a flight of No. 6 (A.C.) Squadron working from an advanced base which has been formed at Bair, and aircraft from No. 14 (B) Squadron, operating from Maan and Amman.

AVIATION IN FOREIGN COUNTRIES

FRANCE.

AIR ESTIMATES.—The Budget for 1930 Air Expenditure has passed the Chamber of Deputies without any important modifications. The debate was remarkable for the smallness of the number of deputies who attended, the early stages being carried through before an attendance sometimes as low as thirty. During the course of the debate, the Air Minister, in answer to mild criticism from the Left, pointed out that the Air Ministry had only been in existence for just over a year and that it was too early to expect him to produce any great results. He outlined

the work that had been done to improve technique in both civil and military aviation, and re-stated his policy of concentrating civil aircraft firms into three or four big companies to control everything from the production of aircraft material to the operation of air routes. The Air Minister also re-stated his policy of dispersing the existing concentration of aircraft firms from the neighbourhood of Paris.

THE NEW ORGANIZATION.—The amalgamation of the military and naval air services to form an Air Force is proceeding slowly. The necessary laws have been drafted, and will be discussed in the Chamber during the coming Summer. In the meantime, a working agreement has been drawn up and is being acted upon.

COLONIAL AVIATION.—Considerable attention is being paid to Colonial Aviation. Preparations are being made to open an air line across the Sahara to the Congo during 1930. It is hoped to extend this line to Madagascar during 1931. The air forces in West Africa will be increased to two squadrons before the end of the year, and a squadron will be added in Central Africa in 1931. In Madagascar ground parties are at work preparing for a squadron, which will arrive there during this year.

The French air line to the East will, as soon as possible, work in co-operation with Imperial Airways, and will deliver the French mail to Baghdad. From there Imperial Airways will carry it on to Rangoon, where it will be transferred to a French line for conveyance to Indo-China.

PROVISION OF NEW AIRCRAFT.—With regard to the production of new aircraft, the Air Ministry now pays for the construction of approved prototypes. After these have been produced and tested the Air Minister has the right to order their production in series by any firm he pleases. According to his statement in the Chamber recently, about eighty new types of aircraft are due to be tested during 1930. About half of these are military types, mostly of metal construction.

GERMANY.

INTERNATIONAL FLIGHT ROUND EUROPE.—The organization of this year's international competition for light aircraft is being carried out by Germany, who were the winners of last year's competition. The contest is divided into two parts :—

(i) A flight round Europe ;
(ii) A number of technical tests.

The flight starts from Berlin, and the course will be via Belgium to England, with compulsory stops at Bristol and an aerodrome near London, then on through France to Spain, back through France to Switzerland, Germany, Austria, Czecho-Slovakia, Poland, East Prussia, the Polish Corridor, and finishing at Berlin. The total distance to be covered is approximately 4,700 miles, during which about thirty compulsory stops are to be made.

The technical tests include starting and landing tests, and a petrol consumption test, and marks will be awarded for practical qualities possessed by competing aircraft in respect of comfort, ease of erection and dismantling, engine starting, etc.

Prize money will amount to 300,000 francs, with a first prize of 100,000 francs.

Although both Italy and Holland competed last year, they have decided not to participate in this year's competition.

GOVERNMENT SUBSIDIZATION OF GERMAN AIRCRAFT INDUSTRY.—During the coming financial year, the policy of the German Government will be to grant

subsidies only to the four following firms :—

Junkers Flugzeugwerke A.G., Dessau.
Dornier Metallbauten G.m.b.H., Friedrichshafen.
Heinkel Flugzeugwerke G.m.b.H., Warnemünde.
Bayerische Flugzeugwerke A.G., Augsburg.

These firms will receive orders from the subsidised organizations, i.e., the Deutsche Luft Hansa (German Air Traffic Concern), Deutscher Verkehrs Fliegerschule (German Flying School for Commercial Pilots), and the Deutscher Versuchsanstalt für Luftfahrt (German Aeronautical Experimental Establishment).

The effect of withholding subsidies from the smaller aircraft firms may be that some of them will be compelled to go into liquidation, and already, as the result of lack of Government support, one or two firms are said to be in financial difficulties.

ITALY.

COMPETITION FOR TOURING AIRCRAFT.—The Aero Club of Italy is organizing a competition for touring aircraft to be held this year, which will consist of an air race round Italy. Prizes amounting to 1,000,000 Lire are being awarded, and the race will be divided into four stages, the total distance being about 1,500 miles :—1st stage : Rome—Naples—Foggia—Rimini ; 2nd stage : Rimini—Vicenza—Trieste—Venice ; 3rd stage : Venice—Trento—Turin ; 4th stage : Turin—Rome.

The full regulations for the race are to be published shortly.

EXHIBITION AT ROME.—A national exhibition of touring aircraft is to be held in May at the Littorio Aerodrome (Rome), and a similar international exhibition is to be held next year.

NEW MEDITERRANEAN SERVICE.—An agreement has been concluded with the Greek Government by the Italian Aero Expresso Company, whereby an experimental service will shortly be put into operation between Athens and Rhodes, connecting with the Athens-Brindisi line. There will be one outward and one homeward flight weekly to start with.

JAPAN.

The following is the achievement of the Japan Air Transport Company for the six months from the opening of business on 1st April, 1929, to 30th September, 1929 :—

Distances flown (*in* 1,000 *kms.*).

Lap.	*Scheduled.*	*Accomplished.*	*Unaccomplished.*	*Per cent. accomplished.*
Tokyo—Osaka ..	266	200	66	75
Osaka—Fukuoka ..	157	124	32	79
Fukuoka—Ulsan ..	20	16	4	80
Ulsan—Seoul ..	48	35	12	74
Seoul—Dairen ..	94	61	32	65
Total.. ..	585	426	146	75
Osaka—Shanghai Line.—				
Osaka—Fukuoka ..	39	33	6	84
Total General ..	624	459	152	75

Thus the total distance of accomplished flights is 75 per cent. of the total distance scheduled. The number of forced landings was 28, of which 16 were due to engine trouble and 12 to weather conditions. Almost all of these landings occurred with Salmsons, which were provisionally used for carrying mail. In the case of Fokker passenger carriers, only one forced landing was made, and this for the purpose of inspecting the oil gauge on a flight between Tokyo and Osaka.

The number of passengers from Tokyo who were dealt with at the Tokyo branch from 15th July, when the transport of passengers was begun, to 10th October was 460, of which 21 were foreigners and 27 women. The result in regard to passengers was as good as expected, but the amount of goods and mail matter carried was disappointing.

POLAND.

The following developments in military and civil aviation took place during 1929 :—

(*a*) The establishment of an Under-Secretariat for Air under the Ministry of War. This new Under-Secretariat has taken over the administration of both military and civil aviation.

(*b*) Continued development of the national aircraft and aero-engine industry, with a view to becoming independent of foreign supplies.

(*c*) Continued re-organization of the Air Force.

(*d*) The amalgamation of all civil air traffic companies into one national air traffic company, called " Lot."

UNITED STATES.

Naval Aviation.

Reporting on naval aviation in 1929, the *Army and Navy Journal* of Washington says, the resignation of fourteen naval aviators is one of the outstanding features. Separation from the Service of these highly trained fliers is an indication of the difficulties experienced in supplying and maintaining a sufficient number of pilots to meet the requirements of naval aviation.

Piling up a total of 219,540 hours in the air, navy aeroplanes, exclusive of those of the Marine Corps, made a record of safety that is considered satisfactory, in spite of the fact that there were 64 major crashes with 7 pilots killed in Service machines. Much of the flying was done under extra hazardous conditions, as of the total 81,950 hours are credited to the forces afloat, with 137,590 for the forces ashore.

A great deal of the sea operations was flying from the " Lexington " and " Saratoga," and the hazards were increased by the sustained operations in connection with the manœuvres off Panama in the early part of the year.

During the year there were in service an average of 513 naval aviators, 175 naval aviation pilots and 89 reserve naval aviators. Three naval aviators, one pilot and six reserve naval aviators were killed, three of the last class being killed in commercial planes.

Army Air Corps.

The 1st Pursuit Group of the U.S. Army Air Corps carried out winter manœuvres during the period 8th to 29th January. The personnel consisted of

23 pilots and 20 mechanics. The aircraft, which included 18 fighters, 3 transport (troop carriers), and one standard reconnaissance, were fitted with skis in place of the usual undercarriage. Throughout the manœuvres the group covered a total distance of 3,500 miles under most severe weather conditions.

The object of the manœuvres was two-fold :—

(*a*) To test efficiency of personnel and material (for maintenance purposes mechanics were carried in the transports) ;

(*b*) To obtain experience with and test the value of short wave W/T in aircraft operating in remote regions.

Throughout the flight weather conditions were extremely difficult, the temperature at times registering 32° below zero, in addition to which fog and heavy snowstorms were encountered. A few forced landings were experienced, but, with the exception of one " write-off," only minor mishaps occurred to the aircraft, which were repaired by the personnel. During the earlier part of the manœuvres some difficulty was experienced by the flight in starting their engines in the early mornings and " plumbers fire pots," and, when available, steam heating appliances were resorted to, the former proving particularly effective. Much useful information was obtained on the changing of engines and cylinders under Arctic conditions, these being necessary owing to seized engines and broken connecting rods.

Regarding personnel, several members were treated for frostbite, and pilots found it necessary to fly without goggles, owing to continued freezing over of the lenses.

Air Corps Manœuvres in Panama Canal Zone.—According to a recent Press report, the U.S. Army Air Corps intends to carry out a rather ambitious scheme in connection with the Spring manœuvres. A total of 116 aircraft are to proceed from four points in the United States via the various Republics in Central America, where stops will be made *en route*. The starting points in the States are as follows :—

25 aircraft from Coronado, California—over 2,600 miles to Panama.
24 aircraft from Langley Field, Virginia—over 3,000 miles.
37 aircraft from Fort Crockett, Texas—over 2,000 miles.
30 aircraft from Selfridge Field, Michigan—over 3,000 miles.

The object of these manœuvres in connection with the defence of the Canal Zone, is to test the mobility and efficiency of Air Corps fighting and bombing units between the United States and Panama. It is understood that fleet aircraft will also take part in the operations, but numbers are unknown.

Naval aircraft have taken the major part in all combined manœuvres hitherto held in the Caribbean Sea, and as far as the Panama Canal Zone is concerned these have resulted in repeated recommendations for an increase in the defences, particularly air. The existing defence forces are said to be totally inadequate, although the identity of a potential enemy is not very apparent.

A system of well-established air routes now links up the several Republics lying between the States and Panama, and although the scheme outlined above appears to be somewhat ambitious, there is no reason why these long concentration flights should not be successfully carried through with the facilities that will be available.

U.S. Civil Aviation Statistics.

Department of Commerce—Licences issued up to 16th December, 1929.—The statistics issued by the Department of Commerce, relating to Civil Aviation in the United States, show that the following licences have been issued :—

Active Pilot Licences	9,472
Student permits	29,324
Mechanic licences	7,404
Aircraft licences	6,646
Aircraft identified (awaiting licence)	3,060

Airways in Operation.—As at 15th December, 1929, the following table gives details of United States Civil Airways :—

Mail Airways in operation	26,597	miles
Other Airways in operation	9,368	,,
Total Airways in operation	35,965	,,
Miles flown daily on mail airways	51,230	,,
,, ,, ,, ,, other ,,	36,756	,,
Total miles flown daily on all airways	87,986	,,

Airway Statistics, period January to June, 1929.—The following summarises activities on scheduled airways only, and does not include taxi flights, etc. :—

Miles flown	9,201,338
Passengers carried	52,473
Express matter carried (pounds)	976,219
Mail carried (pounds)	3,468,562

Airports.—The number of airports in the United States as listed by the Department of Commerce on 1st December, 1929, was as follows :—

Municipal Airports	440
Commercial Airports	465
Intermediate Airports	278
Army Air Corps Stations	70
Naval Air Service Stations	14
Other Government Air Stations	2
Marked Auxiliary Fields	240
Total	1,509
Proposed Airports, additional to above	1,278

AIRSHIP NOTES

GREAT BRITAIN.

The initial programme of home flight tests of the two new airships, " R.100 " and " R.101," has now been satisfactorily accomplished, and the following is a brief summary of these operations, which may be of interest :—

" R.101."		" R.100."	
Launched 12th October, 1929.		*Launched 16th December, 1929.*	
Date.	*Duration.*	*Date.*	*Duration.*
14th Oct., 1929	.. 5 hrs., 41 mins.	16th Dec., 1929	.. 5 hrs., 47 mins.
18th Oct., 1929	.. 9 hrs., 38 mins.	17th Dec., 1929	.. 6 hrs., 29 mins.
1st Nov., 1929	.. 7 hrs., 15 mins.	16th Jan., 1930	..13 hrs., 36 mins.
2/3rd Nov., 1929	..14 hrs., 14 mins.	20th Jan., 1930	.. 7 hrs., 18 mins.
8th Nov., 1929	.. 3 hrs., 4 mins.	27/29th Jan., 1930	.. 53 hrs., 52 mins.
14th Nov., 1929	.. 3 hrs., 9 mins.		
17/18th Nov., 1929	..30 hrs., 39 mins.		
30th Nov., 1929	.. Housed.	30th Jan., 1930	.. Housed.
Total	..73 hrs., 40 mins.	Total	..87 hrs., 2 mins.

In the course of these operations, " R.101 " was moored to the mooring-tower for a total period of 36 days, and " R.100 " for 12 days.

The present programme of airship development, which was inaugurated in 1924, aimed at the construction of airships of approximately twice the size of any previously built in this country, involving entirely new principles of design and fulfilling exacting requirements as to factors of safety. They were to provide accommodation for 100 passengers, be capable of flying to India with one intermediate stop, and of mooring to a tower in winds up to 60 m.p.h. Arising out of the Imperial Conference of 1926, at which the Canadian Government undertook to erect a mooring tower at Montreal, the additional requirement of trans-Atlantic flight was imposed.

Speaking on the Air Estimates, Mr. Montague, Under-Secretary of State for Air, said that the new section being inserted in " R.101 " would increase her capacity by 500,000 cubic feet, giving an additional lift of 9 tons. It was untrue that this addition was being made to counteract an unanticipated defect; it had been found possible to make this alteration because of the satisfactory strength which the airship's tests had disclosed. " R.101," he said, was moored out during the whole of November, and confounded the prophets of disaster by safely riding out storms in which the wind gusted up to 83 miles an hour.

The proposed programme for 1930 for " R.100," he informed the House, consisted of flights to Montreal and back between May and September, and between October and March scheduled flights between Cardington and Ismailia. For " R.101 " a flight to Karachi and back in September or October was contemplated, then again to Karachi in December or January, after which there are to be mooring trials and experimental flying from Karachi.

The alterations to " R.101 " should be completed by the end of April, and certain flights will take place preliminary to this programme.

REVIEWS OF BOOKS

GENERAL

Open House in Flanders, 1914-18.

In the review of this book which appeared in the February number of the JOURNAL, allusion was made to the authoress' admiration for the British commanders, particularly Lord Allenby, which, said the reviewer, "was only exceeded by her boundless affection for his son, Amaury." This was a misprint for "*her* son . . . who served eventually in the French Flying Corps."

Dominion Autonomy in Practice. By A. B. Keith, D.C.L., D.Litt. (Oxford University Press). 5s.

In the preface to this book the author states that it is a revised edition of his previous work, "Dominion Home Rule in Practice," but it is obvious that owing to the changed status of the Dominions since the Imperial Conference in 1926, and a great number of other secondary developments, it is substantially a new book. Professor Keith makes a detailed study of these changes and developments, the problems which have resulted, and those of the future. He gives a clear and concise account of the functions and powers of the various Dominion Governments and the special powers of the Imperial Government with regard to the conduct of both internal and foreign affairs, including a short chapter on defence. This is followed by an interesting and informative appreciation of the achievements and potentialities of the Imperial Conferences.

The book is full of information, well arranged and readable, and an excellent bibliography is provided at the end.

Britain and the Baltic. By E. W. Polson Newman, B.A., F.R.G.S. (London: Methuen & Co.) 1930. Price 10s. 6d.

A perusal of this work leaves little doubt that British political and commercial interests are far more deeply involved in the problems surrounding the Baltic States and the Baltic Sea than is popularly supposed. The author makes this perfectly evident in his well-balanced and judicially minded summary of the several questions that unquestionably still remain unsolved in those regions. We would particularly draw attention to his summary of those thorny subjects, the Polish Corridor and the position of the Free Town of Danzig. The author ends his remarks on the first problem with Foch's opinion: "There lies the root of the next war." After reading that chapter we feel inclined to be convinced by his arguments; the first symptom of difficulty might come soon—when the Poles have completed their new port of Gdynia, near Danzig. This harbour is certain to have a prejudicial effect on the trade of the latter town. Again, we would draw attention to the author's views concerning Latvia which he regards as the key of the Baltic States. Lastly, there seems to be much sound sense in Major Polson Newman's conclusions regarding the quarrel between Poland and Lithuania concerning the possession of the town of Vilna. He considers that "the

decision to give Vilna to Poland was the best that could be done in the circumstances;" but he is "compelled to admit that Lithuania has come badly out of the controversy." The sore is still far from healed.

Where the book seems to fail to satisfy an inquisitive reader is in enlightening him as to the actual relations of the new States with the Soviet Republic. That is a very grave and intricate problem, which it seems impossible for any man who has not spent many years both in Russia and in these ex-Russian countries to attempt to fathom. However, we can remain well satisfied with what Major Polson Newman has given us.

NAVAL

Tromp's Journal, 1639. By C. R. Boxer. (Cambridge University Press). 21s.

This work throws much new light on the Campaign of 1639. The journal covers all the preliminary dispositions adopted by Tromp to intercept the Spanish Armada, the actions of the 16th and 18th September which resulted in the latter seeking an asylum in the Downs, the ensuing blockade, and the final action of the 21st October. It is very much a business affair. Tromp tells us daily the conditions of the weather; what ships were spoken or searched; what detachments were made, and so forth; but he shows little sense of the magnitude of events and the actions of the 16th and 18th September are treated in the same dry tone as the decision to careen some ships at Falmouth. Even the dramatic setting of the month-long blockade of the Spaniards, with the English anxiously trying to maintain the peace in "the King's Chamber," fails to cause so much as an undulating ripple in the flatness of his style,—except perhaps when some Dunkirkers escaped by the Gull Stream after Pennington had assured him that they would not. His impassivity, however, was a source of some strength. It enabled him to prevaricate convincingly (at the same time he thinks that the English "cannot be trusted") and, when some escaping Spanish soldiery were seized off Margate by a Dutch ship flying English colours, to defend himself by calmly stating that he had not ordered such a course! The Journal then is mainly valuable as an aid to the study of the actual campaign, but indeed in this connection is *in*valuable.

Not the least attractive part of Mr. Boxer's book is the introduction, which is a careful, scholarly account of the whole campaign, making use also of Portuguese, English and other sources—notably "A Great Sea-Fight," by Peter White, who was Master of Pennington's flagship and came into personal touch with Tromp. Mr. Boxer gives us an admirably clear account of the assembling of the Spanish Fleet and of their numerous mistakes—mostly repetitions of 1588! He is, perhaps, most open to criticism when he blames the English for their resistance to search by the Dutch. After all, if they were unreasonable, they had been given cause enough during the preceding years, and if the Dutch demands in 1639 were executed with courtesy (as Tromp ordered they should be) it must be remembered that the Dutch were adepts at becoming well-behaved when it suited them. The mere fact that both they and the Spaniards had secret orders not to hesitate to destroy each other in English anchorages points to a state of affairs that might pardonably make the English suspicious!

The Loss of the "Hampshire." By A Survivor—W. C. Phillips, late Chief Shipwright. (Hepworth & Co., Ltd., Tunbridge Wells). 1s. 6d.

Interest in this little booklet, which includes the record of H.M.S. "Hampshire" from the beginning of the War, will naturally centre in the very live account of the

last tragic moments when the ship was taking to their doom over six hundred souls, including that great inspiration of the nation's manhood, Lord Kitchener.

Written in the simple, direct, style of the man who has followed a sea calling all his life, Mr. Phillips' narrative gives the lie direct to one of the most unscrupulous campaigns of misrepresentation which ever blackened the record of a British newspaper, and finally disposes of those flights of fancy which exceeded the license wont to be extended to even the most irresponsible journalist. The present author, by his own showing, is no word painter, but a man with a retentive memory and a cool head in the face of emergency. He testifies to certain vital matters which were within his own personal knowledge and observation: there can be no better witness. He tells us that:—

(*a*) Nothing was known in the "Hampshire" of Lord Kitchener's mission to Russia until about an hour before she sailed. So little notice was received, that even the cabins were not ready for this important passenger and his staff. A premeditated attack on the ship was therefore impossible.

(*b*) Outside Scapa Flow the sea was so heavy that the escorting destroyers "suffered terribly" and were soon sent back as they could scarcely make headway.

(*c*) The explosion which sank the ship was external, not internal.

(*d*) Lord Kitchener was last seen on the upper deck with the waves already breaking over the ship; it was impossible to launch a boat, much less that one should live in such seas. (The survivors floated ashore on a Carley Float—a kind of very large life-buoy).

(*e*) All suggestions of previous attempts to torpedo the "Hampshire" and of foul play on board are pure inventions.

There has never been any real mystery about Kitchener's death, and the fact that the "Hampshire" was sunk by mines laid by the German submarine "U.75" was made known to the public many years ago. In 1926, when a scurrilous newspaper "stunt" had been started, the Admiralty issued a lengthy official narrative (White Paper—Cmd. 2710) giving particulars based on the evidence taken at the Court of Inquiry. But the public is not wont to read White Papers; it is all the more to be hoped, therefore, that they will read this human, honest, little record.

The Ayesha—A great Adventure. By Kapitanleutnant Hellmuth von Mücke. (Philip Allan & Co., Ltd.) 7s. 6d. net.

Lieutenant von Mücke tells the tale of how he and his men made their escape from Cocos Island, where they were marooned whilst their ship, the "Emden," was fighting her last fight against the "Sidney"; he tells it graphically and on the whole fairly. There are, it is true certain inaccuracies and exaggerations; some of these are due to the fact that the book was written in German and was translated and published in the United States during the war, as a piece of propaganda. The errors are explained by the editor, Mr. J. G. Lockhart, in a series of footnotes, and he also gives an account of the "Emden's" career in his Introduction. The defects do not, however, spoil the tale itself; in its way it is a small epic. It needed no small courage on the part of von Mücke to embark with his forty-nine men in the small three-masted schooner, "Ayesha," which was in by no means too good a seaworthy condition, and to make the long voyage across the Indian Ocean and up the Red Sea. They had many adventures and finally suffered shipwreck. But von Mücke, with fine resolution, carried on; he crossed the desert to the railway and in the end reached Constantinople and Germany with his men. The book makes a really good yarn.

MILITARY

History of the British Army. Vol. XIII. By the Hon. J. W. Fortescue, LL.D., D.Litt. With a separate Volume of Maps. (Macmillan). 40s.

With this, the thirteenth and last volume, Sir John Fortescue closes his thirty years' monumental task of compiling the History of the British Army for some two hundred years. He continues his trenchant criticism of the manner in which the State served out tasks to an instrument which it so often neglected and so seldom troubled to keep sharp. Between 1852 and 1870 the army was called on to deal with the war in the Crimea, an expedition to Persia, the suppression of the Indian Mutiny, a campaign in China, a fierce campaign on the N.W. Frontier of India, an expedition into unknown Abyssinia, and several Maori outbreaks in New Zealand. Could experience of foes, of climate, or of terrain be more diversified? The long peace in Europe since Waterloo found the army at home hopelessly inadequate in strength and entirely lacking in organization to deal with a war against a European power in the distant Crimea. Commanders, in which Sir John includes those of battalions, had failed to learn the lessons that might have been expected from experience of campaigns in India and the Cape. Courage alone could not atone for lack of intelligence. Of the commander-in-chief, Lord Raglan, he says, "the absurdity of the whole enterprise entrusted to him and the division of command make criticism practically impossible"; but he considers he possessed very high qualities as a commander.

In his chapters on the Mutiny, Sir John brings out very clearly the co-relation of the various operations after the first period of disorganization and weakness of those in high places. He criticises Sir Colin Campbell's decision to advance to the relief of Lucknow before dealing with the rebels from Gwalior under Tantia Topi. Neither Havelock nor Sir Colin are considered to merit the popular belief in their generalship. The commander whose reputation stands out in high relief is Sir Hugh Rose.

The China War, but for the interference of the diplomatic agents, was a well-managed little expedition under Sir Hope Grant's popular leadership.

The Ambela campaign gives Sir John an obvious opportunity to return to his former indictments of the old time methods of the Indian Government and its political officers in dealing with the tribesmen of the N.W. Frontier of India. Of the Abyssinian expedition, Sir John says that it was perhaps the most difficult and hazardous enterprise in which a British army was ever engaged, the principal difficulty being not to beat the enemy but to reach him. The whole problem was one of transport and supply, the organization of which was seriously jeopardized at the beginning by the refusal of the Bombay Government to accede to the requests of the commander, Sir Robert Napier.

The campaigns in New Zealand were, in scale, petty enough but afford many lessons for savage warfare, not the least being the usual lesson of organization of the supply and transport services.

One of the most valuable portions of the History to the student are the periodic reviews of the relations between the State and the Army throughout the two centuries which the History covers. Sir John adduces ample evidence to justify his statement in his peroration that two centuries of persecution could not wear out the Army's patience. The chapters on Home Affairs between 1840–1870 in the present volume show how at last the War Office was acquiring control and every department was being reformed.

Sir John pays a well-merited tribute to Mr. Herbert Cribb, whose maps are such a feature of the History. But what should be the tribute from the Army to its patient historian; of that Army, of which the historian says that through two hundred years "dutiful to its masters, merciful to its enemies, it clung steadfastly to its old simple ideals—obedience, service, sacrifice."

Sherman. The Genius of the Civil War. By B. H. Liddell Hart. (Ernest Benn, Ltd.) 21s.

Over a quarter of a century ago Colonel Henderson brought before the British reading public the value of the long four year American Civil War as a study in leadership and in the principles of strategy exemplified in a war which was virtually between nations in arms. Captain Liddell Hart, like Brigadier Fuller, has taken up the mantle dropped by Henderson, but under its cloak he advances pet theories of his own. While Brigadier Fuller has used Ulysses S. Grant as his medium, Captain Liddell Hart takes Grant's great lieutenant, Sherman. Unfortunately he allows his undoubted aptitude for writing on the subject of war to be discounted by an insistence on certain fixed ideas which he finds he can only press home by a denunciation of acknowledged leaders in war whom he conceives have had other ideas. He sets up a "sin of orthodoxy" so that he may knock down the idol by methods which he delights to think unorthodox. He has much to say on the iniquities of direct assault and the virtues of the indirect approach as exemplified by Sherman's Atlanta campaign, in opposition to Grant's operations in the circumscribed area of Virginia. He fails to take into consideration that the common objective was achieved by operations in two separate theatres in which the conditions were totally different, but to which they were each well adapted. It seems to us that he makes unnecessary claims for Sherman at the expense of Grant. He will have it that it was Sherman who foresaw, and first thought of, the moral effect of a campaign directed against the economic life of the Southerners. We prefer the evidence to the contrary given by Brigadier Fuller. It is perhaps a small matter which of two great leaders first thought of a far-reaching strategical plan. The outstanding lesson was that the statesman, Lincoln, at last introduced unity of command and that it was exercised by Grant in a plan which depended for its success on the courage and imagination of a lieutenant, Sherman, in whom he had implicit confidence.

Captain Liddell Hart unfolds Sherman's character, and the gradual growth of the fact that war must be waged against the enemy people as well as its armies, with skill, and has written a biography which soldier, sailor and statesman should find of real interest. The maps are adequate but are so placed as to cause the reader a maximum of inconvenience if he wishes to study them with the text.

Marlborough. The Portrait of a Conqueror. By Donald Barr Chidsey (John Murray). 15s.

Mr. Chidsey is an American. He allows that his book is compiled rather than originally conceived. But the manner of the compilation is distinctly refreshing. The result is a most readable—and at times racy—character sketch of the Great Englishman, who rose from being a penniless ensign to the position of Commander-in-chief of the allied armies in the Netherlands, who was the acknowledged strategist-in-chief to the Grand Alliance, who organized a British Army which gained the approbation of the world, and gained for himself the fame of being one of the greatest, if not the greatest, commander the world has known. A great deal of the book is devoted to the influences surrounding Marlborough at home. There are delightful touches delineating the beautiful Sarah and Rolly-Polly Anne. Though the generalship of the campaigns is dealt with briefly, it is done so skilfully that the greatness of Marlborough as a strategist stands out clearly and truly. Nor do the battles suffer from the brevity of their description; for instance, the effect of the attack on the French in Blenheim village is given in the words "They were bottled and Cutts was the cork" Could it be bettered?! Mr. Chidsey follows Mr. Atkinson and Mr. Taylor in retrieving Marlborough's character from

the slurs which, due to the writings of Macaulay, Thackeray and Swift, have too long held the field. As he says, it is preposterous to judge Marlborough's actions by modern standards.

L'Infanterie Sacrifiée. By General Arthur Boucher. (Paris: Berger-Levrault). 10 francs.

This is a very curious book. The author claims the right to speak for the French infantry, having been born in the 27th Regiment of the Line in 1854, and at once inscribed on its books as "enfant de troupe"; having served in it from fourteen to eighteen as "tambour," and eventually being colonel of it under its new number, 101st. During the war he commanded three Territorial infantry brigades. In spite of his age, General Boucher seems to have all the ideas of the "Young Turks" of 1914: that battles are still won by the "courage" of the infantry pushing on regardless of fire.

The reason for his rushing into print is to raise objection to the French regulations, "Instruction provisoire sur l'emploi tactique des grandes unités" of 1921, the equivalent more or less of our F.S.R., which contain the following "principles":—

> "Fire is the preponderant action of combat."
>
> "Artillery is, par excellence, the arm of fire, fire is its sole means of action."

Thus, he says, the artillery must now be the principal arm. He forgets that there is such a thing as co-operation and that even the infantry has fire-arms. He admits, however, that the regulations also lay down other principles:—

> "The primordial importance of the moral factors: courage, discipline and patriotism," and
>
> "The infantry is charged with the principal task in battle."

But, he says that they are contradictory to those already cited, and only inserted to "gild the pill to the infantry."

At great length, backed by a somewhat inaccurate historical knowledge of the war, he argues that it was the courage of the infantry and not the fire of the artillery which won it. Most readers who saw anything of the French troops, and those who have followed the German account of the battle of the Marne will recall that the infantry depended greatly on the artillery, and that it was the fire of the 75's which stopped the Germans.

Working through the careers in high command of Joffre, Nivelle, Pétain and Foch, he attributes Joffre's success (?) up to the battle of the Marne to his "demanding victory of the courage of the troops and putting the power of fire in second place." After the Marne he relied on fire, and therefore failed, as did Nivelle; whilst Pétain was little better, trusting artillery more than infantry. Foch, on the other hand, sought always to break the will power of the enemy, and, as this could only be done by fighting, he attacked and forced his Allies to attack—to their great loss, one might say, until the time was ripe in August, 1918. He absurdly exaggerates Foch's influence over the Allied and French generals.

One feels that this old infantryman has some inkling of the truth, but it is obscured by the love of his own arm. Fire alone, not even fire from tanks or aeroplanes, cannot win battles: it assists the infantry to win them. It is absurd to say that the new French theory is that "artillery conquers, the infantry occupies;" it is rather "fire conquers, the infantry occupies." One can go with him in his dictum that

> "History shows that from the moment an army puts its confidence in the number and power of its machines (armes de jet), it affirms its decadence,"

although one hesitates to go further that

> " it exposes itself to be easily beaten by an army numerically weaker which puts *all* its confidence in the arms it carries in its hands " (armes de main).

The Cavalry went through. By Bernard Newman. (London: Victor Gollancz.) 1930. 7s. 6d.

Building castles in the air is always a fascinating pastime; equally amusing it is to re-write history as it might or should have worked out in actual fact. In this spirit Mr. Newman has written this novel of what might, could or should have been done to win the war—and that by direct military action—by 1917.

It is an attractive theme and has been well handled. The author obviously has first-hand knowledge of war, and betrays a keen tactical insight, while he brings into play all the pet ideas that he evidently formed while actually at the front. There is in fact a mass of sound criticism of accepted methods to be found in these pages. But after all the ideal is not always attainable. When we read of a battalion of men, mostly coming from Overseas, being taught German in a few weeks—and that to a sufficient proficiency to be able to examine prisoners—we begin to wonder how far that ideal battalion is really a practicable proposition! On the other hand, in reading of the destruction and consequent paralysis of the enemy's rearward services brought about by the infiltration of a picked battalion are we not merely stating what many of us thought could have been achieved by similar parties deposited behind the enemy's front from aeroplanes? The picture is suggestive for the future. Quality before quantity is another pet thesis of the author.

The story is soon summarized. Henry Berrington Duncan, after an early and successful career in Colonial Administration, raises a battalion of picked men for service in the Great War in Africa. From Africa the battalion comes to France, distinguishes itself greatly. It is expanded to a brigade—the " Iron Brigade," then into an " Iron Division " (Shades of Alvensleben!). Duncan meanwhile makes his way from battalion commander to Field Marshal commanding the British Armies in France. He then wins the war outright.

The book deserves to be widely read far less because of the story as by reason of the military lessons and moral which it contains. As to the identity of " Mr. Newman " it is unnecessary to speculate; sufficient to state that he is not always very sympathetic with regard to the professional soldier.

Notes on Appreciations, Instructions, Operation Orders and Message Writing (with examples). By Major O. G. Body, D.S.O., R.A., *p.s.c.* (London: Hugh Rees, Ltd.) 1930.

Among the many books on this and similar subjects that have appeared in the past thirty years, this little volume stands out as both practical and useful. It is of course primarily concerned with helping candidates for promotion examinations; as such it must need suffer from certain defects which are inevitable in this type of production. It would be ungenerous, however, to pick holes in it. The re-appearance of the two Ordnance maps (1" to 1 mile) and the use of the familiar ground and exercises for illustration of orders all shows how quickly we are recovering from the effects of the Great War.

Historical Illustrations to Field Service Regulations, "Operations," 1929. By Major H. G. Eady, M.C., R.E., *p.s.c.* With a Foreword by Field-Marshal Sir George Milne, G.C.B. (London: Sifton Praed & Co.) 1930. 10s. 6d.

This book, or one on the same lines, appeared in 1926 and ran into a second edition a year later. There is little need to say more than that the present revise, which is equivalent to the production of a new work, fully achieves its purpose, which is to provide a background of historical examples to Field Service Regulations. The author set out with the purpose of producing a book for the assistance of candidates for promotion examinations; it is calculated to do so effectually.

REGIMENTAL HISTORIES

A Short History of The Royal Army Medical Corps. By Colonel Fred. Smith, C.B., C.M.G., D.S.O., R.A.M.C. (Retired Pay). (Gale & Polden). Price 1s. 6d.

This little book was primarily written to assist privates of the R.A.M.C. to pass an examination in the history of their Corps. It is, however, compiled on a scale rather above this standard and may interest any general reader in search of information under this heading.

Memories of the Artists' Rifles. By Colonel H. A. R. May, C.B., V.D. (Howlett & Son, London). 10s.

This History of the Artists' Rifles, 28th (County of London) Bn., The London Regiment, which covers the whole life of the unit from 1860 to the present day, was compiled by one who served forty years in the Corps. There is consequently a personal note running throughout the volume which will enhance its interest to all who have served in it. This feature is still further emphasized by the mass of illustrations which make up a third of its bulk, as well as the long section devoted to regimental anecdotes.

History of The King's Own Yorkshire Light Infantry in the Great War: 1914-1918. By Lieut.-Colonel Reginald C. Bond, D.S.O. With 13 Illustrations and 14 Maps. Volume III. (London: Percy Lund, Humphries & Co., Ltd.) 1930.

This volume is a continuation of the history of the Regiment, which has already occupied two volumes. It is compiled by the Commanding Officer of the 2nd Battalion of the Regiment that went to France in August, 1914. It contains a detailed narrative of the activities of the K.O.Y.L.I. throughout the Great War. The 1st joined the 2nd Battalion at the front in 1915, and from that time the expansion of the Regiment proceeded apace. The Regiment fought in Italy, in Macedonia and in Egypt, as well as in France. The narrative goes into some detail and is plentifully illustrated with clear and useful maps, also with a few photographs.

History of the 1st Sikh Infantry. (Madras: The Diocesan Press, Vepery) 1929.

This book really consists of three volumes bound into one. Volume I (172 pages) deals with the period 1846-1886 and appeared in 1887. Volume II (101 pages), covering the years 1887-1901, was included in a new edition of 1903. This reprint now includes Volume III (194 pages) and treats of the years 1902-1920. It also contains Appendices relative to all three volumes.

The new volume narrates the story of the 51st Sikhs (Frontier Force) during the Great War. That Regiment served in Egypt during 1915; then fought for two years in Mesopotamia; finally it was transferred to Palestine for Allenby's final campaign against the Turks. It then remained at Jerusalem until 1920, when it returned to India.

The Regimental History of the 3rd Queen Alexandra's Own Gurkha Rifles (from April, 1815, to December, 1927). Edited by Major-General Nigel G. Woodyatt, C.B., C.I.E., Colonel 7th Gurkhas. (London: (Philip Allan & Co.) 1929.

The 3rd Gurkhas were originally raised in 1815; a second battalion was added in 1891. Further 3rd and 4th Battalions were formed during the Great War. The Regiment has a good record of active service from the Mutiny down to the Great War.

This attractive volume, well supplied with maps and 16 appendices, relates the entire history of the 3rd Gurkhas. The 2nd Battalion of the Regiment fought in France in 1915, and throughout the Palestine Campaigns. The 3rd Battalion fought in Palestine; the 4th Battalion in Waziristan.

The History of the King's Regiment (Liverpool, 1914-1919. By Everard Wyrall. Volume II, 1916-1917. (London: Edward Arnold & Co.) 1930. 7s. 6d.

This volume relates the history of the battalions of the King's Regiment in France from January, 1916, down to the 30th June, 1917. This covers the whole of the fighting on the Somme and the Battles of Arras. The activities of the various battalions of the King's are woven into a continuous narrative which is admirably recounted and adequately illustrated with maps.

AIR

Aviation Year Book. By Charles E. Lee. (Sampson Low). 5s.

Every year new air lines are established, new flying clubs are formed, further notable flights are made, until those who would keep track of the course of aeronautical progress find it increasingly difficult to do so. The information is disseminated over so wide a field that the culling of it all has become impossible. Mr. Charles Lee has therefore performed a valuable service in bringing together the chief facts about civil aviation in his "Aviation Year Book." Anyone in search of statistics about the light aeroplane movement, the more important air races, the air lines, the law relating to aircraft, air stamps or the aircraft manufacturing companies can find it in this book and can place confidence in the accuracy of what he reads. The book, though largely statistical, is not dull. An examination of some of the sections reveals some historical events which are of interest, although they are now almost forgotten. Few people are aware, for example, that the first attempt to fly the Atlantic was made twenty years ago by an American airship. The crew of six was rescued by a steamer. In the same year of 1910, Lieutenant Gibbs attempted to give an exhibition of flying at Durango near Bilbao. There was delay in the arrival of his machine, and when it did arrive the crowd of 30,000 had become so hostile that they broke it and attacked Gibbs, saying that he was an impostor and that flying was impossible. There are certain subjects upon which fuller information would be an advantage, such as the distribution of markets and the exports and imports of British air material. But there is only one serious deficiency and that is the absence of an index. No doubt Mr. Lee will remedy this defect in future issues.

ADDITIONS TO THE LIBRARY

GENERAL

LORD LANSDOWNE. By Lord Newton, P.C. 25s. 8vo. (Macmillan & Co., London).

TÉMOINS. Essai d'analyse et de critique des souvenirs de combattants édités en Français de 1915 à 1918. By J. Norton Cru. Frs. 100. 8vo. (Les Etincelles, Paris). Presented by Captain H. Grant Duff, R.N.

ANNALS OF A CHEQUERED LIFE. By A. M. Brookfield. 15s. 8vo. (John Murray, London). Presented by the Publishers.

COMMANDO. By Deneys Reitz. 15s. 8vo. (Faber & Faber, London).

BRITAIN AND THE BALTIC. By E. W. Polson Newman. 10s. 6d. 8vo. (Methuen & Co., London).

THE CAVALRY WENT THROUGH. By B. Newman. 7s. 6d. 8vo. (Victor Gollancz, London). Presented by the Publishers.

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ENGLAND IN THE NINETEENTH CENTURY, 1801–1805. By A. F. Fremantle. 16s. (George Allen & Unwin, London).

MARLBOROUGH. By D. B. Chidsey. 15s. 8vo. (John Murray, London). Presented by the Publisher.

THE DESERT ROUTE TO INDIA. The journals of four travellers by the Great Desert Caravan Route between Aleppo and Basra, 1745-1751. Edited by D. Carruthers. 8vo. (Hakluyt Society, London).

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THE CAMBRIDGE HISTORY OF INDIA. Vol. III, from 1200–1526. Edited by Sir Wolseley Haig. 42s. 8vo. Vol. V: BRITISH INDIA, 1497–1858. Edited by H. H. Dodwell. 30s. 8vo. (Cambridge University Press).

BEYOND THE BALTIC. By A. MacCallum Scott. 12s. 6d. 8vo. (Thornton, Butterworth, London).

CHANGING CONDITIONS OF IMPERIAL DEFENCE. Essays on Military Geography. By Captain D. H. Cole. 8vo. (Sifton Praed, London). Presented by the Publishers. 6s. 6d.

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AMERICA AND ENGLAND. By N. Roosevelt. 7s. 6d. 8vo. (Jonathan Cape, London).

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NAVAL

THE NAVAL BLOCKADE, 1914–1918. By Lieutenant G. Guichard. 15s. 8vo. (Philip Allan & Co., London).

NAVAL DISARMAMENT. A brief record from the Washington Conference to date. By Hugh Latimer. 3s. 6d. 8vo. (The Royal Institute for International Affairs, London).

THE JOURNAL OF MAARTEN HARPERTSZOON TROMP. Translated and Edited by C. R. Boxer. 21s. 8vo. (University Press, Cambridge). Presented by the Publishers.

THÉORIES STRATEGIQUES. Tome II. By Admiral Castex. Frs. 54. 8vo. (Société d'Editions Geographiques, Maritimes, etc., Paris). Presented by the Publishers.

MILITARY

SHERMAN. By B. H. Liddell Hart. 21s. 8vo. (E. Benn, Ltd., London). Presented by the Publishers.

THE ARMY LISTS OF HODSON'S HORSE, 1857–1928. Reprinted from Official Army Lists. 8vo. ("Civil & Military Gazette," Lahore).

L'INFANTERIE SACRIFIEE. By General A. Boucher. Frs. 10. 8vo. (Berger-Levrault, Paris). Presented by the Publishers.

NOTES ON APPRECIATIONS, INSTRUCTIONS, OPERATION ORDERS, AND MESSAGE WRITING. By Major O. G. Body. 8vo. (Hugh Rees, Ltd., London). Presented by the Publishers. 8s. 6d.

HISTORICAL ILLUSTRATIONS TO FIELD SERVICE REGULATIONS, OPERATIONS, 1929. By Major H. G. Eady, M.C., with a Foreword by Field Marshal Sir George Milne, G.C.B., C.M.G., D.S.O. 10s. 6d. 8vo. (Sifton, Praed & Co.). Presented by the Publishers.

HISTORY OF THE BRITISH ARMY. Vol. XIII. By The Hon. J. W. Fortescue. 40s. 8vo. (Macmillan & Co., London). Presented by the Publishers.

A COURSE OF DRILL AND INSTRUCTION IN THE MOVEMENT AND DUTIES OF LIGHT INFANTRY, 1808. By A Field Officer. 8vo. (T. Egerton, London).

REGIMENTAL HISTORIES

THE ROYAL ARTILLERY WAR COMMEMORATION BOOK: Fo. (G. Bell & Sons, Ltd., London). Presented by the Regiment.

A HISTORY OF THE ARMY ORDNANCE SERVICES. By Major-General A. Forbes, C.B., C.M.G. Three Vols. 30s. 8vo. (The Medici Society, London).

HISTORY OF THE 1ST SIKH INFANTRY, 1846–1886. Vol. I. 8vo. (Diocesan Press, Vepery, Madras). Presented by the Officers, 1/12th F.F. Regiment.

HISTORY OF THE KING'S REGIMENT (LIVERPOOL), 1914–1919. Vol. II. By Everard Wyrall. 7s. 6d. 8vo. (E. Arnold & Co.). Presented by the Publishers.

THE KING'S OWN YORKSHIRE LIGHT INFANTRY IN THE GREAT WAR, 1914–1918. By Lieutenant-Colonel R. C. Bond. 8vo. (P. Lund, Humphries & Co., London).

THE HISTORY OF PROBYN'S HORSE. By Major C. A. Boyle, D.S.O. 8vo. (Messrs. Gale & Polden, Ltd., Aldershot). Presented by the Regiment.

AIR

AVIATION YEAR BOOK, 1930. Edited by C. E. Lee. 5s. 8vo. (Sampson, Low, Marston & Co., London). Presented by the Publishers.

Report of Proceedings

AT THE

Ninety-Ninth Anniversary Meeting

TUESDAY, 4TH MARCH, 1930, AT 3.30 P.M.

ADMIRAL SIR GEORGE P. W. HOPE, K.C.B., K.C.M.G.
(*Chairman of the Council*), presiding.

THE SECRETARY (Captain E. Altham, C.B., R.N.) read the Notice convening the Meeting.

ANNUAL REPORT FOR 1929

The Council have the honour to present their Annual Report for the past year.

VICE-PRESIDENTS.

The Council regret to have to record the loss of two distinguished Vice-Presidents through the death of Field-Marshal Ferdinand Foch, G.C.B., O.M., D.C.L. (Maréchal de France), and General Lord Horne, G.C.B., K.C.M.G., D.C.L., LL.D. The former was additional to the List, but the latter vacancy has been filled by the election of General The Viscount Byng, G.C.B., G.C.M.G., M.V.O., LL.D.

Marshal of the Royal Air Force Lord Trenchard, G.C.B., D.S.O., has been elected to the vacancy on the Vice-Presidents' list reserved for an officer of that Service.

COUNCIL.

Rear-Admiral E. A. Astley-Rushton, C.B., C.M.G., has been elected a Member of the Council in the place of Vice-Admiral W. H. D. Boyle, C.B., on the latter becoming an *ex-officio* Member.

Rear-Admiral W. F. French, C.M.G., has been elected in the place of Rear-Admiral W. M. James, C.B., on the latter taking up a sea-going appointment.

Colonel B. Abel Smith, D.S.O., M.C., T.D., A.D.C., has been elected, *vice* Colonel The Duke of Northumberland, K.G., C.B.E., M.V.O., who resigned during the year.

The following Members of the Council, having completed three years' service, retire :—

REGULAR ARMY.

Lieutenant-General Sir W. Hastings Anderson, K.C.B.

Lieutenant-General Sir David G. M. Campbell, K.C.B.

MILITIA.

*Colonel The Lord Ampthill, G.C.S.I., G.C.I.E.

TERRITORIAL ARMY.

*Brigadier-General The Earl of Lucan, K.B.E., C.B., T.D.
Colonel C. W. Trotter, C.B., T.D.

Of the above, those marked * have offered themselves for re-election. This leaves two vacancies for the Regular Army and one for the Territorial Army.

Lieutenant-General Sir A. A. Montgomery-Massingberd, K.C.B., K.C.M.G., and Brigadier B. D. Fisher, C.B., C.M.G., D.S.O., A.D.C., have been nominated to fill the Regular Army vacancies, and Colonel J. Josselyn, C.M.G., D.S.O., O.B.E., T.D., to fill the Territorial Army vacancy.

STAFF.

The Council have had under review the question of pensions or gratuities to the Staff and employees on superannuation. Although there was no legal obligation on the part of the Institution to make such provision, yet, in practice, each case has been reviewed on its merits, with the result that during the year 1929 £185 4s. 0d. was paid to retired employees; moreover, there is the liability of a moral claim on the Institution, arising in the event of death while in service.

After careful enquiry and consideration, a Staff Pensions Scheme has been instituted on a basis of the staff or employee paying 5 per cent. of his or her salary or wages, and the Institution paying a similar amount. Policies have been effected with the Atlas Assurance Company, Ltd., in respect of all the Officers, Clerical Staff, Attendants, and other permanent employees under the age of fifty, whereby much better provision is made for them on superannuation at the age of sixty, or in the event of death, than the Institution could possibly have afforded, or could have been expected to provide, without such a scheme. The annual cost to the Institution, with the present staff and scales of remuneration, is £155 5s. 0d. The policy of the Council in this matter is in line with that adopted by the majority of up-to-date establishments, and the actual scheme is modelled on that approved by the Treasury for the staff of the Imperial War Graves Commission.

It has been made obligatory for any new member of the Institution's staff to enrol under the scheme.

MEMBERSHIP.

During the past year, 178 officers joined the Institution (compared with 215 in 1928). There were 100 withdrawals (compared with 96 in 1928). 41 Life Members and 65 Annual Members died; 48 Members were struck off for being two years in arrears.

The total number of Members on 31st December, 1929, was 5,791. This represents a decrease of total membership on the year of 77 Members but, as the losses include 41 deceased Life Members, the actual financial loss in membership to the Institution is 36.

Details of Members joining are as follows :—

Regular Army (all arms)	100
Indian Army	27
Royal Navy	23
Royal Air Force	19
Royal Marines	3
Royal Naval Reserve	3
Territorial Army	3
	178

The falling-off in Membership during the year is a matter for concern. It is realised that the tendencies towards further reductions of the fighting Services must, to some extent, re-act on our numbers, but our losses are mainly due to the resignation of Members who have retired or are about to retire.

Every effort is now made to cater for the serving officer and to assist him in his professional studies. It is hoped, therefore, that, as this becomes more fully appreciated, the latter will join in increasing numbers.

During 1929, fifteen Junior Officers took advantage of the special facilities extended since the beginning of the year, whereby they can now join without paying an entrance fee.

The Council ask that every Member will try to secure at least one new recruit during the current year. A pamphlet, giving full particulars of the facilities which the Institution affords and alternative forms of joining, will be forwarded on application to the Secretary.

Eardley-Wilmot Bequest.

The Council have pleasure in reporting the receipt of a generous bequest from the late Rear-Admiral Sir Sydney M. Eardley-Wilmot of £100, " to be applied towards the grant of a gold medal, to be given every five years, commencing the fifth year after receipt of the legacy, for the best essay contributed by a Member of the Institution on ' Changes in Naval Warfare owing to New and Modified Weapons,' to be termed the ' Eardley-Wilmot Medal.' "

Admiral Eardley-Wilmot was for many years a Member of the Institution, and in 1879 competed for the Gold Medal Essay under the motto " Qui patitur vincit." His Essay was honourably mentioned.

Finance.

The financial position of the Institution continues to be satisfactory. The balance carried forward at the end of 1929 is £236 16s. 7d., as compared with £229 12s. 2d. for 1928. For purposes of comparison, however, the 1929 figure should be taken as £289 6s. 7d., the difference being accounted for by the fact that the Auditors' Fee for 1929 is debited in the Accounts as well as that for 1928, in order to present this expenditure in a more up-to-date form.

It is with particular satisfaction that the Council are able to report that, as a result of the representations made to the Board of Inland Revenue, the Institution has been finally and officially admitted to be a "charitable" one, within the legal definition of that term. This not only enabled us to reclaim and obtain a sum of £390 9s. 3d., in respect of Income Tax for the three years ending April, 1929, and entitles us to the repayment of Income Tax on our investments in future years, but it also establishes the Institution legally and officially as being engaged in "works beneficial to the community."

This welcome addition to the year's receipts has enabled expenditure to be incurred which, in many respects, was long overdue, but for which funds have not hitherto been available. Amongst other items in this category may be mentioned:—purchase of models representative of the Services of to-day; internal repairs and redecoration of Institution building, especially the large glass skylight over the central staircase; and repairs to some of the many pictures which urgently need attention. Lest it be thought, from the statement in the Accounts showing an expenditure of £79 11s. 2d. over income, that the Council have been unduly extravagant, it is necessary to point out that all expenditure incurred in 1929 is debited, while, in striking the first balance, that year has not been credited with any part of the £390, repaid Income Tax.

Another expense, which it is hoped will pay for itself through increased public interest in the Museum, has been the flood-lighting of the Rubens Ceiling, at a cost of about £80.

It has been thought prudent to increase the fire insurance on the Institution building from £23,102, at which it previously stood, to £40,000, which is regarded as a reasonable figure.

The Council are glad to be able to present a report which shows appreciable progress in the Institution's work and general well-being; but they must remind Members that there is no great working margin in our finances, and that, therefore, future prosperity can only be assured by the undiminished support of the Services.

Journal.

The Journal appears to be steadily gaining in popularity, judging by the outside sales, which again show an appreciable increase. The actual takings from this source during 1929 were £793 9s. 7d., as compared with £754 13s. 2d. in 1928, and £377 6s. 7d. six years ago.

The Institution's publication is now reaping the full benefit of the new advertising contract with Messrs. Gale & Polden, Ltd. This brings in a further income to the Journal of £400 per annum.

The standard of the lectures and articles has been maintained at the customary high level, and a satisfactory number of contributions are now being received from all three Services.

It is desired to give every encouragement to younger officers with new and original ideas to put their views before our readers, and the Editor will always gladly assist those who may be diffident about their literary ability.

The Council desire to acknowledge their indebtedness to the Naval, General and Air Staffs for their co-operation in compiling the professional Notes, and their assistance in connection with articles written by serving officers.

The thanks of the Institution are due to the various lecturers and writers who have contributed to the JOURNAL, and to the Admiral Commanding the Naval War College, and the Director of the Naval Staff College, for facilitating the reproduction of certain lectures originally delivered at those establishments.

LIBRARY.

The number of books added to the Library during the past year was 180. The new volumes include a number of the latest and most important works on Air subjects, which now form a special section of the Library. The new edition of the Encyclopaedia Britannica has also been purchased.

There are now 26,987 books in the Library and 7,420 maps.

The number of books issued from the Library during the year was 4,773, approximately the same as last year.

MUSEUM.

The active steps taken to give effect to the policy of modernizing the Crypt of the Museum, which were a special and very successful feature of 1928, were continued throughout 1929 with gratifying results. Although the total takings were nearly £150 less than in 1928, they were very much higher than in any previous year. The following table affords striking evidence of the increase of public interest in the Museum :—

Year.	*Total Visitors*	*Total Receipts*	*Free Admittance.*		
			H.M. Forces in uniform	*Scouts, Guides, etc.*	*School Children*
		£ s. d.			
1925	28,472	1,065 6 9	2,495	178	1,312
1926	29,457	1,127 18 6	1,894	185	861
1927	37,305	1,427 12 6	2,100	273	1,229
1928	51,693	2,023 2 0	3,027	220	1,187
1929	49,501	1,875 5 3	3,171	465	1,362

The falling-off in takings as compared with 1928 occurred in the early part of the year, and is attributed largely to the bad weather and sickness prevalent in the winter months; but it is also noticeable that more public interest appears to be taken in modern Exhibitions, such as aeroplane models, than in those of an historic nature, such as the panorama of Armada ship models.

The Institution is particularly indebted to the Air Ministry and the Department of Overseas Trade for their invaluable assistance in organizing Special Exhibitions, and for the loan of ship and aircraft models.

Progress has been made in acquiring a permanent set of models representing the latest types of men-of-war and, with the assistance given by the Director of Naval Construction, by permission of the Admiralty, Mr. Ough, who is engaged on the work, has constructed four water-line models representing the battleship "Queen Elizabeth," the flotilla leader "Warwick," the large new submarine "Osiris," and the older "E. Class." For accuracy of detail and perfection of workmanship, these models are probably unique of their kind.

A beginning has also been made in forming a collection representing the latest developments in Army equipment. Messrs. Vickers-Armstrongs have supplied to the Institution's order a scale model of the Carden Loyd, and are now constructing a model of the Mark II. tank. Steps have been taken to acquire models of the latest military bridges.

Contributions to the Museum Purchase Fund to assist in the progress of bringing our exhibits up-to-date will be greatly appreciated.

A particularly notable event has been the fitting of flood-lighting to illuminate the Rubens Ceiling of the Banqueting Hall. This can now, for the first time, be seen in all its magnificent artistic detail, which materially adds to the imposing appearance of the Museum. It has already attracted considerable public interest.

Forty-five generous gifts have been gratefully acknowledged during the past year. These include:—Model of Demarkation Stone, Hell Fire Corner, Ypres; one of the 240 stones marking the extreme limit of the German advance—presented by Major C. ffoulkes; Chinese picture painted on silk—bequeathed by Admiral of the Fleet the Right Hon. Sir Edward Seymour, G.C.B.; engraving by J. Basire, "Le Champ de Drap d'Or"—presented by A. P. Twitchin, Esq.; bronze bust of Admiral of the Fleet Sir Doveton Sturdee, Bart., G.C.B., K.C.M.G., C.V.O.—presented by the Dowager Lady Sturdee.

ROYAL UNITED SERVICE INSTITUTION.

BALANCE SHEET, 31st DECEMBER, 1929.

DR. CR.

To ACCUMULATED FUND—	£ s. d.	£ s. d.
Excess of Assets over Liabilities, as at 31st December, 1928	87,410 12 5	
Additions to Museum Exhibits, etc., catalogued during the year, per contra £335 18 0		
Less: Withdrawals, per contra 106 10 0	229 8 0	
Revenue Account.—Balance, per attached account	236 16 7	
	87,876 17 0	
Deduct: Depreciation of Investments to Market Price, 31st December, 1929 ..	779 6 1	
		87,097 10 11
„ SUBSCRIPTIONS, ETC.—PAID IN ADVANCE ..		259 15 6
„ LIFE SUBSCRIPTIONS—Proportion carried forward		162 16 0
„ SUNDRY CREDITORS		1,216 17 11
„ MUSEUM EXHIBITS PURCHASE FUND ..		32 7 3
„ LEASEHOLD REDEMPTION FUND ..		3,332 7 2
		£92,101 14 9

CHARLES W. TROTTER, CHAIRMAN,
FINANCE COMMITTEE.

E ALTHAM. SECRETARY.

By LEASEHOLD BUILDING—Whitehall, S.W.1, at Cost (covered by Insurance for £40,000) ..	£ s. d.	£ s. d.
		23,101 16 8
„ FURNITURE, FIXTURES, FITTINGS, BOOKS, MAPS, CHARTS, etc. (as valued for Insurance at 31st December, 1926, plus additions)		10,172 6 0
„ MUSEUM EXHIBITS, etc.— (excluding Loan Collection)— As at 31st December, 1928	41,775 7 6	
Additions catalogued during the year ..	335 18 0	
	42,111 5 6	
Deduct: Withdrawals during the year ..	106 10 0	
		42,004 15 6
(NOTE: The Museum Exhibits, including Loan Collection, are covered by Insurance for £67,529 0s. 6d.)		
„ INVESTMENTS at Market Price, 31st Dec., 1929—		
£2,421 18s. 8d. India 3½% Stock ..	1,489 9 9	
£1,000 0s. 0d. 5% War Loan, 1929–47	1,002 10 0	
£6,693 19s. 0d 4% Funding Loan, 1960-90	5,723 6 6	
£4,701 19s. 9d. 3½% Conversion Loan ..	3,491 4 6	
		11,706 10 9
„ LEASEHOLD REDEMPTION FUND— Premiums paid to 31st December, 1928, on Insurance Policies for £23,100 expiring October, 1972	3,266 3 7	
Add: Premium paid during year	66 3 7	
		3,332 7 2
„ SUNDRY DEBTORS AND AMOUNTS PAID IN ADVANCE		340 2 11
„ CASH AT BANKERS AND IN HAND ..		1,443 15 9
		£92,101 14 9

TO THE MEMBERS OF THE ROYAL UNITED SERVICE INSTITUTION.

We have audited the above Balance Sheet dated 31st December, 1929, with the books and vouchers of the Institution, and have obtained all the information and explanations we have required. In our opinion, such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Institution's affairs according to the best of our information and the explanations given to us and as shown by the books of the Institution.

Alderman's House,
Bishopsgate, London, E.C.2.
29th *January*, 1930

BARTON, MAYHEW & CO., Chartered Accountants.
Auditors.

REVENUE ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1929.

DR.

	£ s. d.	£ s. d.
To Salaries	2,181 14 8	
,, Wages and National Insurance	1,986 17 10	
,, Attendants' Clothing	120 6 5	
,, Pensions	185 4 0	
		4,474 2 11
,, Museum Repairs and Sundries and Special Exhibitions	484 16 2	
,, Purchase of Museum Pamphlets	33 15 0	
		518 11 2
,, Journal Printing	1,610 3 10	
,, Journal Postage	346 17 11	
,, Literary Services	274 15 2	
,, Shorthand Notes	41 3 8	
		2,273 0 7
,, Library Purchases and Binding of Books	118 10 10	
,, Periodicals and Newspapers	44 17 0	
		163 7 10
,, Advertising	45 8 6	
,, Lecture Expenses	18 4 6	
		63 13 0
,, Ground Rent	580 0 0	
,, Water Rate	60 3 0	
,, General Rates	558 2 1	
,, Insurance	104 11 11	
		1,302 17 0
,, Fuel	145 0 3	
,, Lighting	332 1 7	
,, Institute Repairs, etc.	250 10 9	
,, House Expenses and Sundries	90 1 3	
		817 13 10
,, Audit Fee, 1929		52 10 0
,, Postages, Telegrams, etc.	91 7 5	
,, Printing and Stationery	210 15 2	
,, Telephone	36 0 5	
,, Travelling Expenses	16 16 7	
		354 19 7
,, Staff Pension Scheme		74 7 6
,, Leasehold Redemption Fund		28 9 1
		£10,123 12 6
To Balance brought down, being excess of Expenditure over Income for the year		79 11 2
,, Accountants' Special Services in connection with Leasehold Redemption Fund, etc.	21 11 6	
,, Audit Fee for 1928	52 10 0	
	74 1 6	
,, Balance carried to Balance Sheet	236 16 7	
	£390 9 3	

CR.

	£ s. d.	£ s. d.
By Members' Subscriptions Received	4,871 11 10	
,, Voluntary Extra Subscriptions	14 8 8	
,, Life Subscriptions—Amount brought to credit	48 9 0	
,, Entrance Fees	329 14 0	
		5,264 3 6
,, Admissions to Museum	1,875 5 3	
,, Sale of Museum Catalogues and Pamphlets	99 15 4	
		1,075 0 7
,, Sales of Journal	772 14 7	
,, Advertisements in Journal	400 0 0	
		1,172 14 7
,, Profit on Repairing Regimental Colours	11 12 11	
,, Profit on Repairing Ships Models	6 0 0	
,, Miscellaneous Receipts	2 1 0	
		19 13 11
,, Rent of Lecture Theatre, etc.		237 19 0
,, Dividends and Interest Received		624 9 9
,, Government Grants		750 0 0
,, Balance carried down		79 11 2
		£10,123 12 6
By Income Tax recovered in respect of years 1926/27, 1927/28 and 1928/29		390 9 3
		£390 9 3

CHESNEY MEMORIAL MEDAL FUND

DR. 31st DECEMBER, 1929. CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1928—			By Goldsmiths & Silversmiths Co., Ltd.—		
Cash at Bankers	68 5 1		2 Gold Medals		29 0 0
Investment at Market Price	195 10 0		„ Depreciation of Investment to Market Price, 31st December, 1929		6 18 0
		263 15 1	„ Balance of Fund at 31st December, 1929—		
„ Dividends received less Tax		7 3 2	Cash at Bankers	49 0 1	
„ Income Tax recovered in respect of years 1926/27, 1927/28 and 1928/29		2 11 10	Investment at Market Price— £230 Bengal and North Western Railway 3½% Preference Stock	188 12 0	
					237 12 1
		£273 10 1			£273 10 1

We have audited the above Statement of the Chesney Memorial Medal Fund for the year ended 31st December, 1929 ,and certify the same to be correct.

Alderman's House,
Bishopsgate, London, E.C.2.
29th January, 1930.

BARTON, MAYHEW & CO., Chartered Accountants,
Auditors.

TRENCH GASCOIGNE PRIZE FUND

DR. 31st DECEMBER, 1929 CR.

	£ s. d.	£ s. d		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1928—			By 1st Prize Essay, 1928	31 10 0	
Cash at Bankers	27 13 1		„ 2nd Prize Essay, 1928	21 0 0	
Investments at Market Prices	1,205 19 8				52 10 0
		1,233 12 9	„ Depreciation of Investments to Market Price, 31st December, 1929		63 0 8
„ Dividends Received, Less Tax	44 13 8		„ Balance of Fund at 31st December, 1929—		
Ditto Gross	5 0 0		Cash at Bankers	58 7 3	
		49 13 8	Investments at Market Prices—		
„ Income Tax recovered in respect of years 1926/27, 1927/28 and 1928/29		33 10 6	£1,862 London and North Eastern Railway 3% Debenture Stock £1,042 14 5		
			£100 5% War Loan, 1929–47 100 5 0		
				1,142 19 5	
					1,201 6 8
		£1,316 16 11			£1,316 16 11

We have audited the above Statement of the Trench Gascoigne Prize Fund for the year ended 31st December, 1929, and certify the same to be correct.

Alderman's House,
Bishopsgate, London, E.C.2.
29th January, 1930.

BARTON, MAYHEW & CO., Chartered Accountants,
Auditors.

BRACKENBURY MEMORIAL FUND

DR. 31st DECEMBER, 1929 CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Balance of Fund at 31st December, 1928—			By Hugh Rees, Ltd.—Books and Maps		17 0 4
Cash at Bankers	21 3 4		„ Librarian, Staff College—Books, etc		1 5 6
Investment at Market Price	432 12 7		„ Royal United Service Institution—		
		453 15 11	Administration Fee		1 1 0
„ Dividends Received, Gross		21 1 0	„ Depreciation of Investment to Market Price—		
			31st December, 1929		10 10 6
			„ Balance of Fund at 31st December, 1929—		
			Cash at Bankers	22 17 6	
			Investment at Market Price—		
			£421 1s. 0d. 5% War Loan, 1929–47 ..	422 2 1	
					444 19 7
		£474 16 11			£474 16 11

We have audited the above Statement of the Brackenbury Memorial Fund for the year ended 31st December, 1929, and certify the same to be correct.

Alderman's House,
Bishopsgate, London E.C.2
29*th January*, 1930.

BARTON, MAYHEW & CO., Chartered Accountants,
Auditors.

EARDLEY-WILMOT MEDAL FUND

DR. 31st DECEMBER, 1929 CR.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Bequest under the Will of the late			By Balance of Fund at 31st December, 1929—		
Rear-Admiral Sir Sydney M. Eardley-Wilmot		100 0 0	Cash at Bankers	1 4 3	
„ Interest on Deposit		9 3	Investment at Cost—		
			£100 5% Conversion Loan 1944/64 "A" Stock	99 5 0	
					100 9 3
		£100 9 3			£100 9 3

We have audited the above Statement of the Eardley-Wilmot Medal Fund for the year ended 31st December, 1929, and certify the same to be correct.

Alderman's House,
Bishopsgate, London, E.C.2.
29*th January*, 1930.

BARTON, MAYHEW & CO., Chartered Accountants,
Auditors.

THE CHAIRMAN: In moving the adoption of the Report and Accounts I do not propose to keep you long. Copies have been on the table for some time, and I think you will agree that the Report is a very satisfactory one. The Institution seems to be in a very flourishing condition. The only black spot to which I would draw your attention is the falling off in the number of Members. We must, of course, realize that the tendency is towards a reduction in the Services, but at the same time there are a very large number of officers in all three Services who do not yet belong to the Institution. The Council has, therefore, resolved to issue an appeal to all Members of the Institution, asking them to do their utmost to secure at least one additional Member during the coming year. If even a small proportion of Members act up to that, it ought to have a satisfactory effect, while if all do so, we shall be on a bed of roses.

I should like to make acknowledgments to the Admiralty, the War Office, and the Air Ministry for their recent notifications to the Services regarding the advantages of the Institution, and their support of the Institution in many directions. The notifications have already had a marked effect, and we hope that this will show itself still more in the months to come.

I would call your attention to the announcement in the Report of the Eardley-Wilmot Bequest. You will notice that the first competition for this Medal will be held in 1935.

FINANCE.

With regard to finance, I have nothing to add to what is stated in the Report, but I much regret that Colonel Trotter, who has been a Member of the Council since 1912, and Chairman of the Finance Committee for nine years, is unable to attend this Meeting owing to illness. He has now resigned from the Council, and they have passed a resolution that a letter shall be written expressing the thanks of the Institution for the long services which he has rendered.

JOURNAL, LIBRARY AND MUSEUM.

With regard to the Journal, Library and Museum, again I have nothing to add to what is stated in the Report. In the absence of the Chairman of the Journal Committee, Colonel Colvin is prepared to answer any questions relating to that subject as well as the two latter.

No questions were asked.

The Chairman then moved:—

"That the Report and Accounts, as circulated, be taken as read and adopted."

CAPTAIN SIR DAVID WILSON BARKER, KNT., R.D., R.N.R.: I beg to second the motion.

The resolution was adopted unanimously.

RE-ELECTION OF AUDITORS.

COLONEL J. JOSSELYN, C.M.G., D.S.O., O.B.E., T.D.: I beg to propose:—

"That Messrs. Barton, Mayhew & Co. be re-elected Auditors for the ensuing year at a fee of fifty guineas."

COLONEL H. C. WYLLY, C.B.: I beg to second that.

THE CHAIRMAN: I should like to point out that the name of the firm has been slightly altered. It was originally Messrs. Blackburn, Barton & Co., but it has been reconstituted during the year and now operates in the name of Barton, Mayhew & Co.

The resolution was adopted unanimously.

VACANCIES ON THE COUNCIL.

THE CHAIRMAN: As the number of nominations of candidates for the Council does not exceed the number of vacancies, there is no necessity for a ballot. I therefore, ask the Meeting to elect the following:—

REGULAR ARMY (2 *vacancies*).

Lieut.-General Sir A. A. Montgomery Massingberd, K.C.B., K.C.M.G.
Brigadier B. D. Fisher, C.B., C.M.G., D.S.O., A.D.C.

MILITIA (1 *vacancy*).

Colonel The Lord Ampthill, G.C.S.I., G.C.I.E.

TERRITORIAL ARMY (2 *vacancies*).

Brigadier-General The Earl of Lucan, K.B.E., C.B., T.D.
Colonel J. Josselyn, C.M.G., D.S.O., O.B.E., T.D.

This was agreed to unanimously.

GOLD MEDAL ESSAYS, 1929.

THE CHAIRMAN: The Secretary will now report the result of the Gold Medal Essays, 1929.

THE SECRETARY: The reports of the Referees having been received, the sealed envelopes containing the names of those who had gained the Gold Medal and the Trench-Gascoigne Prizes were, according to the decision of the Council, opened at the last Meeting of the Council in order that the awards might be made at this Meeting. As a result, it was found that the Gold Medal and the first Trench-Gascoigne Prize had been gained by Wing-Commander C. J. Mackay, M.C., D.F.C., R.A.F.; and the second Trench-Gascoigne Prize by Brigadier-General H. Rowan-Robinson, C.M.G., D.S.O.; while essays submitted by Lieutenant-Colonel C. L. Day and Flight-Lieutenant G. M. Knocker, R.A.F., have received honourable mention.

THE CHAIRMAN: Wing-Commander C. J. Mackay, who was then a Flight-Lieutenant, was awarded the Gold Medal and the first Trench-Gascoigne Prize in the competition of 1921, when the subject was "The Influence of the Future of Aircraft on the Problem of Imperial Defence." The subject for which he has now again won the prize was "The Role of Aircraft in Coast Defence."

THE CHAIRMAN then presented to Wing-Commander Mackay the Gold Medal and first Trench-Gascoigne Prize amid much applause.

AIR VICE-MARSHAL C. L. N. NEWALL, C.B., C.M.G., C.B.E., A.M.: I have to move:—

> "That the thanks of the Institution be accorded to Rear-Admiral W. F. French, C.M.G., Major-General C. A. Ker, C.B., C.M.G., C.B.E., D.S.O., and Air-Commodore P. B. Jourbert de la Ferté, C.M.G., D.S.O., for adjudicating on the Prize Essays."

REAR-ADMIRAL E. A. ASTLEY RUSHTON, C.B., C.M.G., seconded.

The resolution was carried unanimously.

THE CHAIRMAN: If there are any questions which any Member present would like to raise, now is the opportunity.

No questions were asked.

VOTE OF THANKS TO THE CHAIRMAN.

FIELD-MARSHAL SIR CLAUD W. JACOB, G.C.B., K.C.S.I., K.C.M.G., in proposing "That the thanks of the Institution be accorded to the retiring Chairman," said:—

The Chairman's duties are generally rather a thankless job, because he is the target for all criticisms that may be going, but I am sure that our Chairman for the past year, Admiral Sir George Hope, has performed his duties admirably and tactfully, and we ought to be extremely grateful to him. (Applause).

ADMIRAL SIR W. E. GOODENOUGH, G.C.B., M.V.O., A.D.C., seconded the resolution, which was carried unanimously.

THE CHAIRMAN: Thank you very much. I greatly appreciate what has been said with regard to me, and I should like to take this opportunity of recording my own thanks to all the Members of the Council who have helped me so much in the past year, and particularly my deep appreciation to our Secretary, Captain Altham, and the Staff of the Institution for the way in which they have striven to help me and to assist everything that furthers the interests of the Institution.

The proceedings then terminated.

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